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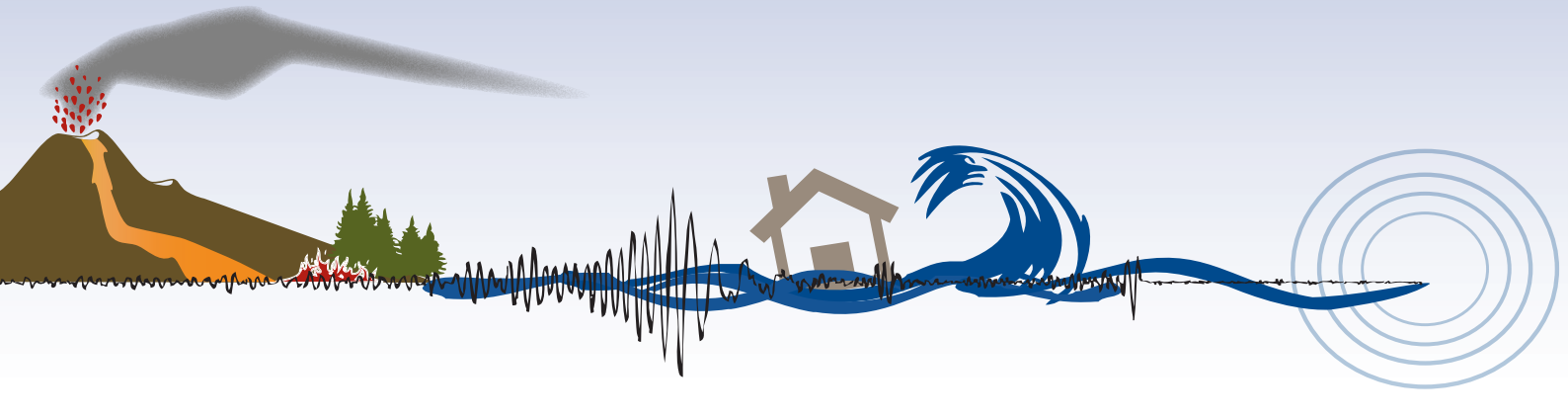

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Capacity building for child and adolescent mental health in disaster areas: Learning from the experiences of mental health care workers in Indonesia

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Abstract

This paper describes lessons learned from mental health workers who participated in Capacity Building for Child and Adolescent Mental Health in Disaster Areas (CAMHD) training of trainers in Jakarta. This training module was developed by the Child and Adolescent Psychiatry Division of the Department of Psychiatry of Cipto Mangunkusumo Hospital and partners, in collaboration with the Institute of Mental Health Singapore and supported by Temasek Foundation, Singapore. Mixed methods research was conducted to evaluate the training and to learn from the participants' experiences. Data were collected from the training participants in the form of pre and post tests, questionnaires demographic data, training evaluation forms, and focus group discussions. All research participants (n = 16) demonstrated increased knowledge, with a statistically significant mean difference of pretest and posttest scores (p < 0.001). Important lessons imparted included early detection – especially using the Strengths and Difficulties Questionnaire, case formulation, and comprehensive management, including Psychological First Aid (and crisis intervention. In terms of training process, training participants appeared to particularly appreciate active learning processes such as case studies, role plays, and discussions, which allowed them to share their experiences. The current research also identified further training and development needs for child and adolescent mental health in disaster areas.

Keywords: *training, disaster, children and adolescents, mental health workers*

Indonesia is prone to disasters such as volcanic erruptions, earthquakes, storms, tsunamis, floods, landslides, and wildfires (Centre for Research on the Epidemiology of Disasters, 2015). Indonesia also has a large population of children and adolescents, with a population of 92.2 million people under the age of 20 years (Statistics Indonesia, 2016). Children and adolescents make up an important at-risk group that requires specific attention in the advent of disasters (Pfefferbaum & North, 2016; Schreiber, Pfefferbaum, & Sayegh, 2012). Mental health and psychosocial support training is needed to equip mental health workers for providing appropriate care and to reduce potential harm, particularly for at-risk groups such as children and adolescents (Pfefferbaum et al., 2012). Professional training is a common, albeit underreported, approach to enhance community readiness in disaster mental health (Jordans, Luitel, Poudyal, Tol & Komproe, 2012). However, there is limited training for mental health workers to address the specific needs of children and adolescents in disasters, especially in Indonesia (Wiguna, Guerrero, Kaligis & Khamelia, 2010).

The current paper describes lessons learned from action research to evaluate a Capacity Building for Child and Adolescent Mental Health in Disaster Areas (CAMHD) training-of-trainers module in Jakarta (Wiguna, Kaligis, & Citraningtyas, 2013a, 2013b). The training module was developed by the Child and Adolescent Psychiatry Division of Cipto Mangunkusumo Hospital and partners, in collaboration with the Institute for Mental Health Singapore (IMH), funded by Temasek Foundation as a part of a wider Disaster Mental Health Programme for Communities in Asia (IMH, 2015; Tan & Wiguna, 2013). This training module aimed to enhance mental health workers' understanding of how to provide relevant assistance to children and adolescents in

disaster affected areas. It covered: (1) the potential effects of disaster on child and adolescent mental health, the importance of developing resilience, and how to identify potential resources in the community; (2) early detection of mental health problems in children and adolescents in disaster areas using the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) Indonesian adaptation (Wiguna & Hestyanti, 2012); (3) how to formulate mental health problems in children and adolescents in disaster areas by focusing on bio-psychosocial aspects, and comprehensive management; including (4) Psychological First Aid (Brymer et al., 2006; McCabe et al., 2014), crisis intervention, and stress management. To enhance cultural-embededness, Jakarta-based participants were subsequently asked to adapt the module for different community groups in Aceh, Padang, Magelang, Yogyakarta and Lombok (IMH, 2015). The current study was conducted to evaluate the benefits of the original training of trainers module, to learn from the experiences of mental health workers as participants, and to identify further needs.

Method

The current study was conducted during the five day training module in Jakarta between the 17th and 21st of April 2014. This training was facilitated by eight staff from the Child and Adolescent Psychiatry Division of Cipto Manunkusumo Hospital who had been involved in the development of the original module. It was delivered using a Reference Book of learning materials and a Facilitator's Guidebook for activities (Wiguna, Kaligis, Citraningtyas, 2013a 2013b). The training was designed to stimulate active engagement from participants using case studies, roleplays and discussions. While various administrative processes and resource limitations have caused a time lapse between the study and its publication, study content and findings are still relevant for the current Indonesian context and the training materials are still being distributed for use in a wide range of settings (Wiguna et al., 2015).

The current study used mixed quantitative and qualitative methods (see Cresswell & Clark, 2007) to:

– evaluate changes in the participants' knowledge;
– to understand the participants' experiences of the training; and to
– collect input for further training developments.

Mixed method studies have been demonstrably useful for research into working in complex emergencies such as disasters (Bolton, Tol & Bass, 2009). The current study received ethical clearance from the Faculty of Medicine of the University of Indonesia, Cipto Mangunkusumo Hospital. Data was collected from the training participants in the form of:

– questionnaires
– pre and post tests, using multiple choice questions covering the training materials, and
– focus group discussions.

Questionnaires were used to collect demographic data and participants' written evaluations of the training. Pre and post test scores were statistically analyzed to determine the significance in the difference of the means between paired, pre and post test, groups. The research participants divided themselves based on areas of origin with similar characteristics, into two groups of 7 and 8 persons each for 90-minute semi-structured focus group discussions to further explore their views of the training. The focus group discussions were recorded and transcribed. Identifiable information, aside from profession, was removed. The qualitative data resulting were analyzed thematically through a process of immersion, by coding recurrent keywords and identifying overarching themes (see Liamputtong Rice & Ezzy, 2004).

Participants

Training participants were invited through the networks of the Department of Psychiatry of Cipto Mangunkusumo Hospital. All participants (n = 16) who attended the entire training module agreed to participate in the research. There were seven psychiatrists, four non-specialist/ resident doctors, three psychologists, and two social workers. Participants consisted of 3 men and 13 women aged 25 to 53 years, with a mean age of 38.94 years (SD = 8.20). Eleven participants were married, all of whom had between one and three children aged 1.5 to 26.5 years, with a mean child age of 12.86 years (SD = 7.54). Research subjects came from various ethnic groups. There were four Javanese, four Minang, two Sundanese, two Acehnese, one each from Tapanuli, Bangka and Sunda/Manado, and one Indonesian of Chinese descent.

Thirteen participants had previously provided direct assistance to disaster survivors, such as during the eruptions of the Merapi volcano in Yogyakarta in 2006 and 2011, the earthquake in Solok and Bengkulu in 2007, the earthquake in Padang and Aceh in 2009, the earthquake in Takengon Aceh in 2013, and the

floods in Jakarta in 2013 and 2014. Eleven participants were also first-hand survivors of disasters, including the armed conflict in Aceh in 2000, flooding in Aceh in 2000, the earthquake and tsunami in Aceh and Riau in 2004, the earthquake in Solok and Bengkulu in 2007, and the earthquake in Padang and Aceh in 2009. Five participants had survived more than one disaster. Participants were affected by the disaster in different ways. Some experienced:

– the loss of family members
– the loss of or major damage to their homes
– witnessing armed conflict
– being stuck in or almost being crushed in damaged buildings
– lack of electricity and water for several months, and
– difficulties finding food.

Eight participants were disaster survivors who assisted fellow survivors of the same disaster. Two of them continued to provide assistance to survivors of other disasters. The fact that these mental health workers were themselves survivors was considered an advantage because they provided a highly relevant and practical perspective on the relevance of the training materials.

Results

Pre and post tests demonstrated increased knowledge among all participants. Pretest scores ranged from 7 to 15 out of a total score of 20 (35% to 75%), with a mean of 13 (*SD* = 2.06) (65%, *SD* = 10.33%). More details are provided in Figure 1 and Table 1. The posttest scores ranged from 14 to 19 (70% to 95%), with a mean of 15.8 (*SD* = 1.6) (79%, *SD* = 8.19%). Differences between pre-test and post-tests (mean = 2.75, 13.75%) were statistically significant ($p < 0.001$).

All participants stated that they were either satisfied (*n* = 9) or very satisfied (*n* = 7) with the quality of the training module as a whole. The participants reported that the most memorable aspects learned were, in order of most to least important: Strengths and Difficulties Questionnaire (SDQ) for early detection; case formulation; Psychological First Aid (PFA); crisis intervention; greater understanding of crisis and stress; and needs identification and resource identification for assistance. Table 2 details the topics that participants

Table 1.
Pre and Post Test Scores According to Participant Characteristics

Characteristics (n=16)	Mean pretest score	%	SD	Mean post test score	%	SD
Age (years)						
≤40	12.8	64	2.29	15.85	79	1.49
>40	13.2	66	2.69	16	80	1.85
Sex						
Male	11.0	55	3.60	16.4	82	1.53
Female	13.4	67	1.98	15.8	79	2.31
Profession						
Psychiatrists	14.2	71	0.49	17	85	1.29
Doctors (non-specialist/ resident)	12.8	64	1.7	15.2	76	1.89
Psychologists and social workers	11.4	57	3.65	14.8	74	0.83
Work experience (years)						
≤5	13.6	68	1.38	16.2	81	2.14
>5	13.0	65	2.84	16.0	80	1.70
Marriage and children						
Married with children	13.6	68	2.06	16.6	83	1.51
Unmarried	11.6	58	2.79	14.4	72	0.55
Directly experienced disaster						
Yes	12.9	64.5	2.42	15.75	75,38	1.67
No	13.1	65.0	2.59	16	80	1.69
Experience assisting disaster survivors						
Yes	12.6	63	2.69	15.6	78	1.69
No	13.6	68	1.64	16.4	82	1.52

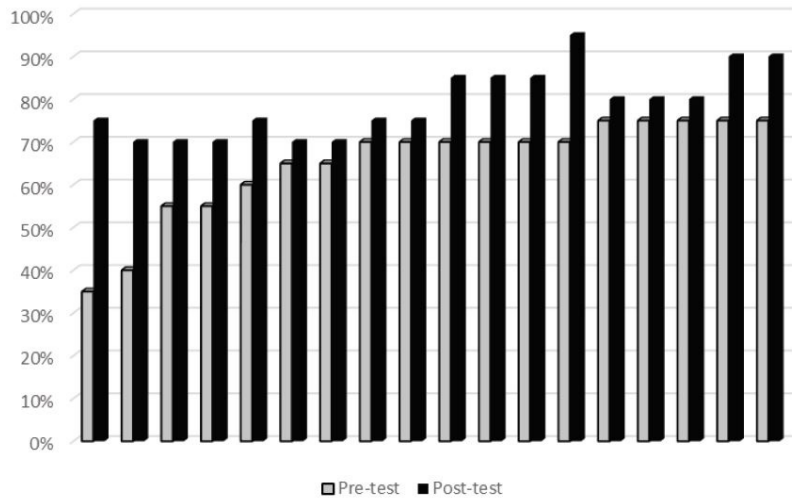

Figure 1. Pretest and posttest scores per participant

learned and percieved that could be applied to their respective work places. In terms of training process, the most common theme identified through thematic analysis was: The benefits of active learning such as through case studies and roleplays. Further details are shown in Table 3. As shown in Table 4, the most memorable aspect was meeting new people and sharing experiences. Overall, it seems that interaction and active engagement were crucial elements of the participants' positive experience.

Table 2.
Most Important Things Learned from the Training that Could be Utilized in Respective Work Places

No.	Things learned	Number of participants that mentioned each theme*
1	Strengths and Difficulties Questionnaire for early detection	12
2	Case formulation	7
3	Psychological First Aid	4
4	Crisis intervention	3
5	Greater understanding of crisis and stress	2
6	Needs identification, particularly to "small" easily neglected yet crucial needs	2
7	Resource identification for assistance	2
8	Disaster readiness	1
9	Comprehensive management	1
10	Basic concepts in disaster mental health	1
11	Additional: How to train others	4

During the focus group discussions, participants expressed three overarching themes: (1) the benefits of the training with respects to the content and process; (2) detailed input to improve the training content and process; as well as (3) further needs for respective professions and further application of the module. These themes are outlined in more detail below.

Benefits of the Training

The main sub-themes identified for this theme were that participants gained: an understanding of a step-by-step approach; and the capacity to use a specific tool, SDQ. A psychiatrist participating in the focus group discussions described developing a systematic step-wise approach as, "If there were a disaster, what steps we can take from the simplest to the most [complex] case formulation – now we know the steps."

Several participants highlighted the SDQ as a practical tool to be used in the community, to improve early detection of problems among children and adolescents affected by disaster.

Table 3.
Most Effective Learning Methods

No.	Learning methods	Number of participants that mentioned each theme
1	Case study	10
2	Role play	7
3	Group exercise	7
4	Group discussions	3
5	Lectures	2

Table 4.
Most Memorable Part of the Training

No.	Memorable part	Number of participants that mentioned each theme
1	Meeting new people and sharing experiences	5
2	Learning something new	3
3	Expert facilitators	3
4	Active training	3
5	Positive interaction with facilitators	2
6	Roleplay, especially playing the part of children and adolescents	2

As one psychiatrist participant described:

> *Up to now we have asked children to draw pictures. The idea is that through the pictures we could identify problems, but those who are not psychiatrists or psychologists may not be able to see the meaning in the picture or what intervention may be necessary. The use of the SDQ is very helpful for us, as people from other professions can count.*

In terms of the training process, participants reported finding the discussions useful and enjoyable. They described their active engagement in the process and emphasized the importance of learning from each other. For example one social worker stated that:

> *I enjoyed the discussion sessions very much... the other participants' experiences in the field, how they have applied things, gave us more [ideas] – so we could do these in the field, [and helped us identify] which [ideas] are not practical or the most appropriate. The discussion sessions were most informative... each person was asked to tell about their experiences and difficulties, and how they have overcome them. That helps.*

Participants also expressed being enriched by roleplays and observing how others may approach particular situations presented during roleplay. For example, one psychiatrist stated that, "We gained a lot from different backgrounds. 'Oh, that person would do it this way, this person would do it another way.' So we gained a lot of input."

Room for Improvement

Participants suggested that the module could be simplified to be used for a wider audience beyond mental health professionals. Participants also mentioned parts of the module that needed to be clarified and better aligned with one another. For example, one participant mentioned being confused between the Primary-Secondary-Tertiary Mental Health Services Pyramid that they are accustomed to using, and the Intervention Pyramid for Mental Health and Psychosocial Support in Emergencies described in the Inter-Agency Standing Committee Guidelines (IASC, 2007). Participants also expected to be presented with more real world cases to demonstrate how interventions can be used. In terms of the training process, participants suggested more efficient use of the time, as some training days had less content and could be compacted.

Further Needs

Participants generally described the training module as at a conceptual or theoretical level, that summarizes understanding and provides guidance on how to assist children and adolescents in disaster affected areas. Participants expressed that, in addition to this broad view, they also needed technical, detailed, specific, simple, and practical tools for field use. Participants expressed the need for hands-on tools that lay people could use to assist mental health responses to disaster, such as guides for taking field notes related to different phases of disasters. For example, one psychiatrist stated that:

> *I feel that for application in the field, we need detailed and specific things for people to administer. So it is true that people need to gain understanding and concepts, I agree, but our friends in the field need something simple to easily use, do – the concept is already there, but when something happens, it is impossible for us to elaborate everything, so if we had a checklist or algorhythm or something like that...*

In addition to practical guidance for field workers, participants discussed the idea of a possible toolbox of toys, books, music and materials to provide as a form of psychological first aid kit to directly assist children and adolescents in disaster affected areas.

Participants also expressed the need for separate training modules, for each profession and competency to be able to perform their respective roles. They also requested specific material for different disasters and different regions with specific cultural and contextual needs. For example, one doctor stated that:

> *According to me, perhaps in the future perhaps we need to develop tiered modules - one for psychiatrists, one for psychologists, one for volunteers, perhaps under one bigger umbrella. For psychiatrists, some parts may need to be explored in depth, according to their competency needs. But for volunteers maybe another part could be highlighted for practical use in the field. For volunteers perhaps we need other volunteers who have been to disaster areas, field workers who have used them, to be invited...*

In other words, the current module could be developed into more specific forms according to the particular needs of different target groups. This was in addition to

participants' expressing the need for ongoing training, surrounding the module in question.

Discussion

In terms of participant backgrounds, the current results demonstrate that disaster responders and survivors are not necessarily separate people. Mental health workers may be affected by disasters and at the same time or in a different context may provide assistance to other survivors, especially in a disaster-prone country such as Indonesia. As Hugelius, Adolfsson, Örtenwall and Gifford (2017) described, health professionals may face a multi-faceted, powerful, and ambiguous experience of being a survivor as well as taking part in disaster response.

While self-care is an essential part of disaster training modules, it needs to address participants not only as helpers, but also as potential survivors with specific needs. Guidelines need to acknowledge that survivors are often the most important helpers for other survivors. Materials for disaster responders therefore need to start with the question of whether responders themselves are disaster survivors who may have specific needs in addition to the capacity and motivation to help others. It is particularly important to cater to these needs because survivor-helpers may also provide greater insight on the relevance of training based on their own unique experiences.

With regards to knowledge enhancement through training, most studies on similar training evaluate improvements in knowledge and specific and other impacts on individuals, such as by pre and post tests of the learning content. The current study demonstrated an increased knowledge up to post test scores of 70% to 95%, with a mean score of 79%, which was statistically different to a mean pretest score of 65% ($p < 0.001$). This increase was similar to findings following the Training of Trainers course in Grenada post Storm Ivan, teaching how to identify community members needing special assistance. Participants in this course had a mean pretest score of 66% and a mean posttest score of 79% (Kutcher et al., 2005). A mental health disaster training program in China also reported an increase in post test scores (Ng et al., 2009). In the current study, the knowledge increase appears related to the participants' reports of benefiting from two distinct types of knowledge: greater understanding of a step-by-step approach and the use of specific tools such as the SDQ.

Beyond specific knowledge enhancement, participants outlined that the key benefits of the training module were interaction between participants and the development of social networks. Participants valued learning from each other's real world experiences of dealing with disasters, particularly in supporting child and adolescent mental health. Interdisciplinary training approaches have also previously been described as a positive approach for disaster mental health (Ren, Wang, Zhang, 2017).

Training can also be an important networking opportunity, in general. As outlined, this course included disaster survivors who reported assisting survivors in other contexts. Networks developed through training may need to be explored in further research as a potential avenue for mutual support in the advent and aftermath of disasters. This seems particularly pertinent for the context in question, which allowed training of participants from different professions and different regions in Indonesia. It is therefore recommended that similar training interventions should focus on and evaluate sharing of experiences and development of networks as important training outcomes. It would be interesting and beneficial to design training and evaluations that focus on network formation and further collaboration among participants towards supporting each other in different disaster areas.

Aside from interprofessional training, the current study presents the need for profession-specific training. The National Preparedness and Response Science Board has recommended disaster mental health training and resources for all mental health professionals in order to equip them to assist their communities (Jacobs, Gray, Erickson, Gonzalez & Quevillon, 2016). While interaction between participants from different backgrounds seemed to be a highlight, as an opportunity to enhance exchange of knowledge and experience, participants also expressed the need for training for the specific competencies of each profession. For example, psychiatrists and psychologists expressed the need for more intensive training in providing specific therapeutic options to children and adolescents with specific mental health conditions related to disasters (Pfefferbaum et al., 2014a, 2014b).

Participants also described the need for disaster-specific and culture/region-specific modules and references, as well as practical tools for field use, like toys. Providing context-specific hands-on tools is particularly challenging for a country with such diverse disasters and cultural backgrounds. The current training therefore

aimed to empower participants to be able to adapt the general approaches and tools to their specific needs, incorporating local resources identified. This aligns with an emphasis on cultural and context-specific factors that mitigate risk and facilitate resilience in children affected by traumatic events, outlined by Ungar (2013).

The current study was limited to the context of the training of trainers at the central level in Jakarta and did not assess further application of the module in diverse Indonesian regions. Studies on further adaptation of this module for specific communities would be an important focus for further work. It would also have been of interest to have conducted follow-up studies to assess long-term knowledge retention and the impacts of applying this training in immediately disaster affected contexts.

Conclusion

This paper presented the background and experiences of mental health care workers who participated in a Capacity Building for Child and Adolescent Mental Health in Disaster Areas training-of-trainers module in Jakarta. A mix of quantitative and qualitative data suggests that the training was well accepted among participants and that there were certain benefits of the training, room for improvement, and further needs concerning work in disaster contexts.

The current study adds to knowledge about evaluating disaster training programs with specific differences to training evaluation conducted in other countries, such as Grenada (Kutcher, Chehil & Roberts, 2005), China (Ng, et al, 2009), Sri Lanka (Gelkopf, Ryan, Cotton & Berger, 2008) India (Becker, 2009) and Nepal (Jordans, Luitel, Poudyal, Tol & Komproe, 2012). The lessons learned from the evaluation on Capacity Building for Child and Adolescent Mental Health in Disaster Areas training-of-trainers module in Jakarta inform further efforts to enhance training in disaster mental health and psychosocial support. The current study highlights the potential dual role of disaster mental health workers as survivors, evidences how mental health and psychological training enhances knowlege enhancement, and emphasizes key benefits such as sharing participant experiences and the development of networks.

The evaluation also revealed further needs for training and tools, including adaptations for specific professions, disasters and disaster affected contexts. At least two different types of training may be required. However, the current study did not include a representative sample for each profession, meaning it was not possible to assess training benefits for participants from respective professions. Profession-specific disaster mental health training modules may be more appropriately streamlined within the curriculum of the respective professions. Beyond the the ambit of the module in question, as outlined by Jacobs et al. (2016), it would be interesting to review more extensive education, for example at the postgraduate degree level.

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References

Becker, S. M. (2009). Psychosocial care for women survivors of the tsunami disaster in India. *American Journal of Public Health, 99*, 654-658. doi: 10.2105/AJPH.2008.146571

Bolton, P., Tol, W.A., Bass, J. (2009). Combining qualitative and quantitative research methods to support psychosocial and mental health programmes in complex emergencies. *Intervention, 7*, 181-186. doi: 10.4236/health.2014.66070

Brymer, M., Layne, C., Jacobs, A., Pynoos, R., Ruzek, J., Steinberg, A., Vernberg, E., & Watson, P. (2006). The psychological first aid field operations guide (2nd edition). Los Angeles: National Child Traumatic Stress Network and the National Center for PTSD.

Centre for Research on the Epidemiology of Disasters (2016). *EM-DAT: The OFDA/CRED International Disaster Database*. Retrieved from www.emdat.be

Cresswell, J. W., & Clark, V. L. P. (2007). *Designing and conducting mixed method research*. Los Angeles: Sage.

Gelkopf, M., Ryan, P., Cotton, S. J., & Berger, R. (2008). The impact of "Training the Trainers" course for helping tsunami-survivor children on Sri Lankan disaster volunteer workers. *International Journal of Stress Management*, *15*, 117-135. doi: 10.1037/1072-5245.15.2.117

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, *38*, 581-586. doi: 10.1111/j.1469-7610.1997.tb01545.x/pdf

Hugelius, K., Adolfsson, A., Örtenwall, P., & Gifford, M. (2017). Being both helpers and victims: health professionals' experiences of working during a natural disaster. *Prehospital Disaster Medicine, 32*, 117-123. doi: 10.1017/S1049023X16001412

Institute of Mental Health (IMH) Singapore (2015). *Building back better: Case studies in resilience building*. Singapore: Temasek Foundation – Institute of Mental Health in Disaster Mental Health Programme for Communities in Asia.

Inter-Agency Standing Committee (IASC) (2007). *IASC guidelines on mental health and support in emergency settings.* Geneva, Switzerland: IASC.

Jacobs, G. A., Gray, B. L., Erickson, S. E., Gonzalez, E. D., & Quevillon, R. P. (2016). Disaster mental health and community-based Psychological First Aid: Concepts and education/training. *Journal of Clinical Psychology*, *72*, 1307-1317 doi: 10.1002/jclp.22316

Jordans, M. J. D., Luitel, N.P., Poudyal, B., Tol, W. A., & Komproe, I. H. (2012). Evaluation of a brief training on mental health and psychosocial support in emergencies: A pre- and post-assessment in Nepal. *Prehospital and Disaster Medicine*, *27*, 235-238. doi: 10.1017/S1049023X12000738

Kutcher, S., Chehil, S., & Roberts, T. (2005). An integrated program to train local health care providers to meet post disaster mental health needs. *Rev Panam Salud Publica*, *18*, 338-345. doi: 10.1590/S1020-49892005000900014

Liamputtong Rice, P., & Ezzy, D. (2004). *Qualitative research methods: A health focus.* Melbourne, Australia: Oxford University Press.

McCabe, O. L., Everly Jr, G. S., Brown, L. M., Wendelboe, A. M., Abd Hamid, N. H., Tallchief, V. L., & Links, J. M. (2014). Psychological First Aid: A consensus-derived, empirically supported, competency-based training model. *American Journal of Public Health*, *104*, 621-628. doi: 10.2105/AJPH.2013.301219

Ng, C., Ma, H., Raphael, B., Yu, X., Fraser, J., & Tang, D. (2009). China-Australia training on psychosocial crisis intervention: response to the earthquake disaster in Sichuan. *Australasian Psychiatry*, *17*, 51-55. doi: 10.1080/10398560802444069

Pfefferbaum, B., Flynn, B.W., Schonfeld, D., Brown, L. M., Jacobs, G. A. … Lindley, D. (2012). The integration of mental and behavioral health into disaster preparedness, response, and recovery. *Disaster Medicine and Public Health Preparedness*, *6*, 60-6. doi: 10.1001/dmp.2012.1

Pfefferbaum, B., & North, C. S. (2016). Child Disaster Mental Health Services: a Review of the System of Care, Assessment Approaches, and Evidence Base for Intervention. *Current Psychiatry Reports*, *18*, 5. doi: 10.1007/s11920-015-0647-0

Pfefferbaum, B., Sweeton, J. L., Newman, E., Varma, V., Nitiema, P. … Noffsinger, M. A. (2014). Child disaster mental health interventions, part I. *Disaster Health, 2*, 46-57. doi: 10.4161/dish.27534

Pfefferbaum, B., Sweeton, J. L., Nitiema, P., Noffsinger, M. A., Varma, V., Nelson, S. D., & Newman, E. (2014). Child disaster mental health interventions: Therapy components. *Prehospital and Disaster Medicine, 29*, 494-502. doi: 10.1017/S1049023X14000910

Ren, Z. J., Wang, H. T., & Zhang, W. (2017). Experiences in disaster-related mental health relief work: An exploratory model for the interprofessional training of psychological relief workers. *Journal of Interprofessional Care*, *31*, 35-42. doi: 10.1080/13561820.2016.1233097

Schreiber, M., Pfefferbaum, B., & Sayegh, L. (2012). Toward the way forward: the national children's disaster mental health concept of operations. *Disaster Medicine and Public Health Preparedness*, *6*, 174-181. doi: 10.1001/dmp.2012.22

Statistics Indonesia (2016). *Statistical yearbook of Indonesia 2016.Retrieved from* https://www.bps.go.id/website/pdf_publikasi/Statistik-Indonesia-2016--_rev.pdf

Tan, C. & Wiguna, T. (2013). Building partnerships to support mental health resilience in Asian communities affected by disaster. *International Association for Child and Adolescent Psychiatry and Allied Professions (IACAPAP) Bulletin*, *34,* 25-27. Retrieved from www.iacapap.org/wp-content/uploads/Bulletin_No34_Feb2013.pdf

Ungar, M. (2013). Resilience, trauma, context, and culture. *Trauma Violence Abuse, 14*, 255-266. doi: 10.1177/1524838013487805

Wiguna, T., Citraningtyas, T., Hadisukanto, G., Ismail, R. I., Pratiti, B., Septa, T. … Rowawi, H. (2015). *Bencana dan kesehatan jiwa anak dan remaja* [Disaster and Child and Adolescent Mental Health]. Jakarta, Indonesia: Media Aesculapius.

Wiguna, T., Guerrero A. P. S, Kaligis, F., & Khamelia, M. (2010). Psychiatric morbidity among children in North Aceh district (Indonesia) exposed to the 26 December 2004 tsunami. *Asia-Pacific Psychiatry*, *2*, 151-155. doi: 10.1111/j.1758-5872.2010.00079.x

Wiguna, T., & Hestyanti Y. (2012). *SDQ: Information for researchers and professionals about the Strengths and Difficulties Questionnaire. Indonesian translation*. London, United Kingdom: Youth in Mind. Retrieved from http://www.sdqinfo.org

Wiguna, T., Kaligis, F., & Citraningtyas, T., (Ed.s) (2013). *Peningkatan kapasitas kesehatan mental anak dan remaja di daerah bencana* [Capacity Building for Child and Adolescent Mental Health in Disaster areas]. Jakarta, Indonesia: Cipto Mangunkusumo Hospital.

A systematic review exploring the presence of Vicarious Trauma, Compassion Fatigue, and Secondary Traumatic Stress in Alcohol and Other Drug Clinicians

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URL: http://trauma.massey.ac.nz/issues/2017-2/AJDTS_21_2_Huggard.pdf

Abstract

The terms secondary traumatic stress, compassion fatigue and vicarious trauma are often used in literature to describe emotional consequences for health professionals working with traumatised clients. While research has paid some attention to social workers, care givers and other health professions in contact with traumatised clients, little specific attention has been paid to clinicians working in the alcohol and drug field. This article reports on a systematic review of literature that looked at what had been said about one or more of the three terms outlined above, for professionals that work within the alcohol and drug field. The aim of this review is twofold. Firstly, to increase awareness of an issue that appears to have gone unnoticed within this sector. Secondly, to highlight the importance of such awareness for clinicians and those involved in managing services within this sector. The current review found few published papers that investigated these terms with reference to alcohol and drug clinicians. However, the available literature reviewed did show that alcohol and drug clinicians are at risk of experiencing secondary traumatic stress and compassion fatigue. No literature was found that discussed vicarious trauma. The implications of this absence of literature are discussed, particularly with reference to the health and wellbeing of alcohol and drug clinicians. Recommendations for future research in this area are discussed.

Keywords: *compassion fatigue, secondary traumatic stress, vicarious trauma, alcohol and drug clinicians/ counsellors, systematic literature review.*

The aim of the following systematic review was to explore published literature that investigated the terms *vicarious trauma*, *compassion fatigue* and *secondary traumatic stress* within the Alcohol and Other Drug (AOD) clinician population. The purpose is to generate an increased awareness of these concepts within this sector and to highlight the importance of such awareness, both for clinicians and for managers of AOD services.

Although acknowledged as an important issue by many health and social service sector professionals, limited attention has been paid to this issue and these concepts within AOD professional groups. The terms secondary traumatic stress, compassion fatigue and vicarious trauma are terms describing the potential emotional effect experienced by clinicians and other health professionals that work with clients who have experienced trauma. Their long-term effects on health professionals engaging with clients' trauma have become viewed as an occupational hazard, as described in a range of prior literature (McCann & Pearlman, 1990; Figley, 1995; Pearlman & Saakvitne, 1995; Stamm, 2010). Interest in this topic has since been growing within the area of health, concerning professional and occupational groups such as physicians (Nimmo & Huggard, 2013; Huggard, Stamm & Pearlman, 2013), audiologists (Severn, Searchfield & Huggard, 2012), veterinarians (Huggard, 2008), therapists (Pearlman & Saakvitne, 1995), emergency workers (Nimmo, 2011), partners of emergency workers (Alrutz, Buetow, Huggard, & Cameron, 2016), refugee support workers (Ismayilov, 2013) and nurses (Vachon, Huggard & Huggard, 2015).

However, the occupational group of alcohol and other drug (AOD) clinicians has historically received little research attention (Bride & Walls, 2007). This clinical group includes counsellors, social workers,

psychologists and other therapists. In the literature examined, no studies have differentiated between specific staff roles, for example between counsellors and psychologists, concerning their different therapeutic approaches and vicarious traumatization, secondary traumatic stress or compassion fatigue. Therefore, for the purpose of this article, AOD clinicians will be considered as one professional group.

Previous research indicates that it is common for AOD counsellors to treat clients with trauma histories (Bride & Kintzle, 2011; Bride, Hatcher & Humble, 2009). Relevant effects on the personal health of AOD professionals and on the effectiveness of their work have been observed. Some of the effects of secondary traumatic stress, compassion fatigue, and vicarious trauma on clinicians that have been described include: experiences of increased anxiety, depression, hopelessness, and hypervigilance (Perkins & Sprang, 2013; Sprang, Clark & Whitt-Woosley, 2007); and symptoms of intrusion, avoidance and arousal (Bride et al., 2009). It is therefore possible that the clinician may tend to avoid the traumatic material being shared by the client, or may tend to stay overly task oriented. They may also minimalize what the client reports, or dissociate from the client at crucial times when clients are sharing their experiences, all as part of a lack of capacity for emotional empathy, which diminishes service quality (Pearlman & Saakvitne, 1995). Furthermore, the clinician may be at a higher risk of making poor professional judgements such as misdiagnoses and poor treatment planning and may withdraw from pleasant activities that they once enjoyed outside of work (Rudolph, Stamm & Stamm, 1997). All or some of these effects can impair the ability of a clinician to work effectively with clients who are seeking their support (Figley, 1999).

Vicarious trauma, compassion fatigue or secondary traumatic stress within the AOD clinician population is important at any given time. However, these dynamics may have greater significance following a major event, such as a disaster, particularly when individuals' psychological functioning may be impaired. The relationship between alcohol abuse and such events has been previously reported by Keyes, Hatzenbuehler and Hasin (2011), North, Kawasaki, Spitznagel and Hong (2004), and by Stewart, Mitchell, Wright and Loba (2004). Individuals with an existing alcohol abuse disorder are more likely to report drinking as a coping mechanism following a traumatic event (Keyes et al., 2011). There is also an extensive literature connecting posttraumatic stress disorder (PTSD) -like symptoms and disasters, as reviewed by Neria, Nandi and Galea (2008). Although no such research was identified during the current review, PTSD-like symptomatology may be experienced by both AOD clinicians and their clients, as a result of disaster events. With respect to AOD clients experiencing a major traumatic event such as a disaster, having a pre-existing condition such as a substance abuse disorder could result in an increase in excessive alcohol or other substance consumption. With respect to AOD clinicians, any impaired psychological functioning following such major traumatic events may be greater given that they may also be experiencing a degree of emotional trauma in relation to their client caseload. These possibilities reinforce the need for clinicians to routinely engage in supportive processes that aim at mitigating the impact of vicarious traumatization, compassion fatigue, or secondary traumatic stress.

Concept Definitions

The concepts of secondary traumatic stress, compassion fatigue, and vicarious traumatization have been explored in earlier articles. While some research suggests that there may be some slight differences between these terms, they all describe a process relating to the impact of being exposed to, or knowing of, the suffering of others (Huggard, Stamm & Pearlman, 2013; Thomas & Wilson, 2004).

Secondary Traumatic Stress

Secondary traumatic stress (STS) has been described as a natural consequence of caring for another individual who has had a traumatic experience (Figley, 1995; Bride et. al., 2009). A STS response by an individual refers to PTSD-like symptoms that occur following indirect contact with traumatic events experienced by a significant other (Bride, Robinson, Yegidis & Figley, 2004; Figley, 1995, 2002). Symptoms can include intrusive cognitions where imagery related to clients' trauma is experienced, along with distressing emotions, avoidance responses, psychological arousal and functional impairment (Figley, 1995; McCann & Pearlman, 1990). The Secondary Traumatic Stress Scale (STSS) developed by Bride et. al. (2009) is a 17-item self-report instrument to assess the frequency of negative effects of those that come into contact with traumatised clients. The scale attempts to measure incidents of PSTD symptomatology, intrusion, avoidance and arousal.

Compassion Fatigue

Compassion fatigue has been described as the negative effects experienced by the health professional having come into contact with, or knowing about the distress and suffering of others (Figley, 1995, 2002; Huggard, Stamm & Pearlman, 2013). Research reported by Figley (1995) has shown that compassion fatigue is a consequence of working with traumatised clients and is determined by the level of exposure the clinician has to the trauma and their capacity to empathise. Instruments designed to measure include the Compassion Fatigue Self-test (CFST) (Figley, 1995), and, more recently, the Professional Quality of Life Scale (ProQOL) (Stamm, 2010).

Vicarious Trauma

Vicarious trauma was initially described by Pearlman and Saakvitne (1995) as a cumulatively undesirable transformation in the therapist who engages empathically with a traumatised survivor's life story. They suggest vicarious trauma refers to a transformation of the clinician's inner experience that results from empathic engagement with clients' trauma material which can make the clinician vulnerable to the emotional and spiritual effects of vicarious traumatisation. These changes can take place in the therapist's professional and/or personal life and include symptoms that reveal themselves within physical, behavioural, psychological and spiritual dimensions. This affects the way clinicians view themselves, their world view, beliefs and values, and therefore over time can change their cognitive schema in a negative way (Pearlman & Saakvitne, 1995). More recent research has explored vicarious traumatisation and identified it as a change process (Pearlman & Caringi, 2009) and has conceptualised certain positive changes resulting from trauma work such as vicarious posttraumatic growth (Arnold, Calhoun, Tedeschi & Cann, 2005) or as vicarious resilience (Hermandez, Gansei & Engstrom, 2007). One instrument designed to measure vicarious trauma is the Traumatic Stress Institute Belief Scale – Revision L (TSI-BSL) which measures and assesses cognitive disruptions in psychological areas of safety, trust, control, intimacy, and power (Jenkins & Baird, 2002).

Although some conceptual differences have been proposed between the concepts of secondary traumatic stress, compassion fatigue, and vicarious traumatization (Thomas & Wilson, 2004), they all describe the impact upon a clinician of working with traumatised clients. Therefore, the aim of the current review was to search literature for articles that featured one or more of secondary traumatic stress, compassion fatigue and vicarious trauma, to determine what has been discussed concerning these dynamics among AOD professionals.

Method

A systematic review of electronic data was conducted using keyword and search criteria to obtain literature for appraisal. Several methods and guidelines exist for reporting of systematic reviews in healthcare research (Nimmo, 2011). This review used the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) (Moher et al., 2009) protocol as a guide. Meta-analysis was not conducted due to the limited range of research articles extracted in the search, the heterogenicity of data, and differences in study design, outcomes, metrics, and participant populations (Ioannidis, Patsoupolos & Rothstein, 2008).

Search Strategy

The electronic data bases searched were Scopus, Cinahl, PsycINFO, Medline, DRUG, Social Work Abstracts, PILOTS and EBASE. Three categories of search terms were used. The first category identified the trauma related concepts under investigation: secondary traumatic stress, compassion fatigue, and vicarious trauma. The second category identified the profession of interest to this review: Counselors, Counsellors, Therapists, Clinicians, Social Workers, Psychologists, and Psychotherapists. Lastly, the third category of interest for the review was to specify what professional field these professionals work in: substance abuse, alcohol abuse, drug abuse, alcohol and other drugs. Search terms for each category were separated by "OR", before categories were combined with "AND". Specific inclusion and exclusion criteria were established for this review, using guidance from Montori, Swiontkowski and Cook (2003). Date restrictions were not included in the inclusion /exclusion criteria in order to identify all available literature.

Literature extracted from each database was then reviewed and screened for relevance according to these criteria. Abstracts were included according to the following: (i) the literature had to mention at least one of the trauma terms under review, (ii) had to mention a profession noted in the above search string, and (iii) had to include members of these professions working in the substance abuse field. Exclusion criteria were: (i) articles not written in English, and (ii) documents other

than journal articles, reports, theses or dissertations. Complete articles were extracted and reviewed for abstracts that met these criteria.

The articles reviewed were then assessed with reference to the criteria in Table 1 which lists the quality standards utilised for this systematic review as previously described by Nimmo (2011) and Nimmo and Huggard (2013). Quality scores were calculated as follows: If a criterion was judged as having been met ("Yes") this counted as one point; except for criterion three which was broken up into five sub-questions, with each sub-question covering 0.2 points. The points obtained for each study were then summed with a maximum possible score of six points. Total points were then divided by the total number of criteria used within the table to assess and give a maximum result of 1.0.

Table 1
Criteria Used to Appraise the Quality of Reviewed Literature

Quality criterion	Y/N	Score
1.The research question/aims/objective is clearly explained		1
2. An appropriate study design has been used		1
3. The study adequately describes the following:		
(i) Sample/Participants		0.2
(ii) Sample strategy		0.2
(iii) Methods		0.2
(iv) Data collection methods		0.2
(v) Context of collection		0.2
4. Construct description and definition		1
5. Researcher reflexivity		1
6. Ethical concerns mentioned		1

Results

Study Selection

An initial total of sixteen references were extracted from electronic databases and one article was extracted from a non-electronic database. Following the removal of four duplicates, thirteen articles were screened. Six articles did not meet inclusion criteria, leaving seven articles for full review, as shown in Figure 1. These seven references met all inclusion criteria and were included in the systematic review. The review summaries for these articles are shown in Table 2.

Results of Quality Appraisal

Results of the assessment of each article against the criteria shown in Table 1 is reported in Table 3. For example, the article by Bride (2007) was judged as meeting all designated quality criteria.

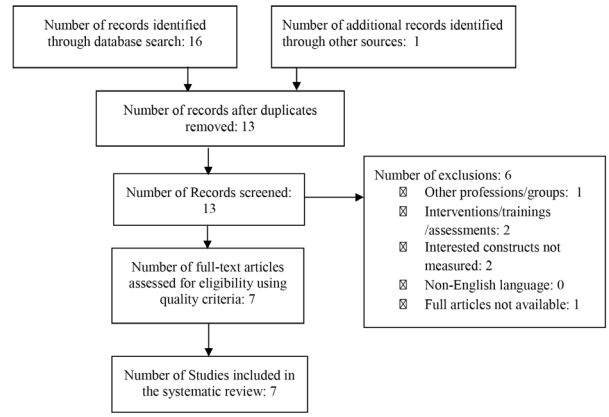

Figure 1. Flow diagram of the modified PRISMA protocol used to select articles included in the systematic review

Discussion

The reviewed literature suggested that substance abuse counsellors and other professionals who work with traumatised clients are at risk of experiencing secondary traumatic stress and compassion fatigue. However, no specific AOD literature was found that discussed vicarious trauma. The reason for such an absence of literature is unknown, but may be due to a limited awareness of these concepts within the substance abuse sector.

Bride (2007) reported that 587 (97.8%) of clinicians surveyed (*N* = 600) had experienced trauma, and that 533 (88.9%) indicated their work with clients addressed issues related to client trauma. Bride, Hatcher and Humble (2009) reported that 218 (97%) of the counsellors within their study (*N* = 225) said they had traumatised clients in their caseload, and indicated that 25 percent of their clients had experienced substantial trauma in their lives. Furthermore, three of the articles reviewed (*N* = 600, *N* = 225, *N* = 216) reported that 55-56 percent of clinicians met the criteria for a least one of the core symptoms clusters of PTSD and between 15-19 percent met the core criteria for diagnosis of this condition (Bride, 2007; Bride et al., 2009; Bride & Kintzle, 2011). Two articles (*N* = 225, *N* = 412) mentioned that almost 20 percent of clinicians surveyed met criteria for secondary traumatic stress (Bride et. al, 2009; Ewer, Teesson, Sannibale, Roche & Mills, 2015). One focused on compassion fatigue, saying that out of 20 participants, 9 had high levels of compassion fatigue (Perkins & Sprang, 2013). The extent of PTSD symptomatology and the levels of compassion fatigue reported in these

Table 2.
Summary of Selected Papers

Reference	Research Aims and Measures Used	Findings
Bride (2007)	To investigate the prevalence of secondary traumatic stress in a sample (*N* = 600) of social workers working in a variety of professional roles, of which (56.6%) identified as mental health or substance abuse as their primary field of practice. Examined the frequency participants met diagnostic criteria for post-traumatic stress and the severity of secondary traumatic stress. This was measured by using the STSS scale.	55% of participants met criteria for at least one of the core symptoms, and 15.2% met core criteria for PTSD.
Bride & Walls (2007)	To provide an overview of the conceptual and empirical literature on secondary traumatic stress as well as recommendations for prevention within a number of professions such as sexual assault counsellors, social workers, child welfare worker, psychotherapists, and trauma therapists.	Revealed that secondary traumatic stress is a reality of work in the designated areas. However, at the time of this literature overview it was found that no studies had been published examining the prevalence of secondary traumatic stress among substance abuse counsellors.
Fahy (2007)	Literature review of empirical research on professionals who provide psychosocial services to traumatised populations that takes a look at vicarious trauma, and compassion fatigue within substance abuse practice.	Revealed that STS is a reality of such work and highlights the need for adequate training, Assessment for PTSD in workers should be standard practice, Research must shape practice to create safety for the client and the professional. Identification of compassion fatigue, and secondary traumatic stress should be a regular part of supervision and counsellor wellness programs.
Bride et al. (2009)	To determine to what extent substance abuse counsellors are trained and if they assess and treat trauma and PTSD in substance abuse clients, and secondly to determine to what extent substance abuse counsellors experience STS. To assess level of STS by administering the STSS (*N* = 225).	75% of counsellors experienced at least one symptom of PTSD in the previous week, 56% meet the criteria for a least one of the core symptoms clusters and 19% met the core criteria for diagnosis of Post-traumatic stress disorder (PTSD).
Bride & Kintzle, (2011)	Purpose of the study was to examine the relationship between Secondary Traumatic Stress (STS) and job satisfaction and turnover retention in a sample of substance abuse counsellors. (*N* = 216) STS was measured using the STSS. Job satisfaction and occupational commitment measured using the ProQOL. Also used a Likert scale to measure trauma clients. Data was analysed with a Statistical Package from Social Sciences version 17.0.	Mean age of 56 years. Primarily female (59%) White (90%). 66 percent had completed masters degrees or higher. With 20yrs average experience. 56% met a least one of the core diagnostic criteria for PTSD. Mean for job satisfaction 12.99, and Occupational commitment mean 4.1. Based on these findings, the authors encourage employers to find ways of increasing job satisfaction as a way of enhancing occupational commitment.
Perkins, & Sprang, (2013)	To examine compassion fatigue, burnout, and compassion satisfaction in two groups of counsellors (*N* = 20) specialising in substance dependency treatment in order to identify the unique features of substance service delivery related to professionals' quality of life. Qualitative face to face interviews were conducted; at the end of the interview each participant completed a ProQOL IV scale, and the general empathy scale. A six-step approach was used to analyse data.	5 of the 20 interviewed scored high for Compassion satisfaction, 3 scored high for burnout, and 9 scored high for compassion fatigue.
Ewer et al. (2015)	The aim of the study was to examine the prevalence of secondary traumatic stress among AOD counsellors in Australia (*N* = 412). Levels of trauma training, extent of exposure to clients with trauma history, AOD counsellors own history of trauma exposure and PTSD, and current STS. Analysis compared those that currently met criteria for experiencing STS and who did not. Analysis was conducted with IBM SPSS Statistic version 20.0. (7.1%) social workers and range of other AOD professionals (26.8%).	One in five (19.9%) meet criteria for STS consistent with the findings of (Bride et al. (2009)

Table 3
Summary of Quality Scores

Criterion	1	2	3(i)	3(ii)	3(iii)	3(iv)	3(v)	4	5	6	Total Score
Articles	Research question clearly stated	Appropriate study design used	Samples/ Participants	Sample strategy	Methods	Data Collection methods	Context of collection	Construct Description and definition	Researcher reflexivity	Ethical Concerns mentioned	
Bride (2007)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1.00
Bride et.al. (2007)	Y	N	N	N	N	N	N	Y	N	Y	0.50
Fahy (2007)	Y	N	N	N	N	N	N	N	Y	Y	0.50
Bride et.al. (2009)	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	0.83
Bride et.al. (2011)	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	0.83
Perkins et.al. (2013)	Y	Y	Y	Y	Y	Y	Y	N	N	Y	0.67
Ewer et.al. (2015)	Y	Y	Y	Y	Y	Y	Y	N	N	Y	0.67

Notes:

For a description of each quality criterion, refer to Table 1.

Scoring: 'Y' = "Yes" criterion is evident. Yes equals 1 point, except for criterion 3, which is broken up into five sub-questions, with each sub-question = 0.2 points. 'N' = the criterion is not evident. Scores were then summed with a possible maximum of 6 and divided by 6 (the total number of criteria used within the table). The resulting score has a maximum of 1.

research findings are of concern. They all exceed levels found in the general population and suggest that clinician's exposure to the traumatic experiences of their client groups is having a negative impact on the clinicians' own health and well-being.

These limited results suggest a possible need for interventions to mitigate the impact of client trauma for clinicians working in the AOD sector. A prior literature review by Fahy (2007) highlighted the importance of assessing clinicians for the presence of PTSD and secondary traumatic stress in all workers. This review also proposed that research must inform practice with PTSD and substance abuse client presentations in a way that creates safety for both the client and the clinician, and that the identification of compassion fatigue, and secondary traumatic stress should be a regular part of supervision and counsellor wellness programs (Fahy, 2007). Furthermore, Ewer et al. (2015) emphasised the importance of substance abuse training in association with trauma training when training clinicians.

Limitations

Few articles could be extracted from the database search, indicating that this is a new area of study that has yet to be given significant attention in the AOD research environment. Of those studies included in this review, there were limited numbers of participants surveyed and a high percentage of Caucasian middle-aged females, with little representation of other ethnicities. The majority of the data was from the USA, and secondary traumatic stress and compassion fatigue were only two concepts examined. No studies explored vicarious trauma, which may have been systematically neglected or which may simply not form part of the common lexicon. Regardless, the current review results suggest a need for further research in the AOD clinician sector, specifically aimed at identifying clinicians' understanding of the three trauma-related concepts, and particularly their relevance to AOD work. Additionally, research is required that identifies effective approaches to preventing the development of trauma-related consequences as well as to fostering appropriate rehabilitative processes.

Conclusions

The results from this systematic review highlight that research into the presence of secondary traumatic stress, compassion fatigue, and vicarious trauma has received little attention within the AOD field. The implication of this lack of attention is that, with vicarious traumatisation not being acknowledged as an important issue within the AOD clinician population, there is considerable opportunity to conduct research in a variety of areas. These research areas may include

gaining an understanding of the prevalence of vicarious traumatisation impacts in this group of clinicians, the state of psychoeducation for clinicians, and the extent of normalisation of relevant impacts. Additional research could explore differences in the impact of trauma-related experiences between clinicians from different professional groups (counsellors, psychologists, psychotherapists, etc.). Research into interventions for mitigating the impact of vicarious traumatization would be particularly useful.

Research is also required to identify stigmatisation of help-seeking. Although this was not addressed in the articles reviewed, it may be an issue in certain parts of the AOD sector. Any resulting lack of intervention may have a long term negative impact on the health and well-being of AOD professionals. The overall lack of relevant literature indicates that further research opportunities into this area exist, particularly into the effects of the three dynamics, and their impacts on the AOD work force. Research into mitigation remains the most pressing priority. As illustrated in several post-disaster contexts, mitigation measures may be particularly in demand from time to time. Given the overall prevalence of relevant and negative impacts, it seems that secondary traumatic stress, compassion fatigue, and vicarious trauma will require ongoing mitigation as part of standard approaches to support within the AOD practitioner community.

References

Alrutz, S., Buetow, S., Huggard, P., & Cameron, L. (2015). *What happens at work goes home.* Poster presented at the Australasian Trauma Society Conference, Gold Coast, Queensland, Australia.

Arnold, D., Calhoun, R. G., Tedeschi, R., & Cann, A. (2005). Vicarious posttraumatic growth in psychotherapy. *Journal of Humanistic Psychology, 45*, 239-263. doi: 10.11771002216780527

Bride, B. E. (2007). Prevalence of secondary traumatic stress among social workers. *Social Work, 52*, 63-70. doi: 10.1093/sw/52.1.63

Bride, B. E., Hatcher, S. S., & Humble, M. N. (2009). Trauma training, trauma practices, and secondary traumatic stress among substance abuse counselors. *Traumatology, 15*, 96-105. doi: 10.1177/1534765609336362

Bride, B. E., & Kintzle, S. (2011). Secondary traumatic stress, job satisfaction, and occupational commitment in substance abuse counselors. *Traumatology, 17*, 22. doi: 10.1177/1534765610395617

Bride, B., & Walls, E. (2007). Secondary traumatic stress in substance abuse treatment. *Journal of Teaching in the Addictions, 5*, 5-20. doi: 10.1177/1534765610395617

Bride, B. E., Robinson, M. M., Yegidis, B., & Figley, C. R. (2004). Development and validation of the secondary traumatic stress scale. *Research on Social Work Practice, 14*, 27-35. doi: 10.1177/1049731503254106

Ewer, P. L., Teesson, M., Sannibale, C., Roche, A., & Mills, K. L. (2015). The prevalence and correlates of secondary traumatic stress among alcohol and other drug workers in Australia. *Drug and Alcohol Review, 34*, 252-258. doi: 10.1111/dar.12204

Fahy, A. (2007). The unbearable fatigue of compassion: Notes from a substance abuse counselor who dreams of working at Starbuck's. *Clinical Social Work Journal, 35*, 199-205. doi: 10.1007/s10615-007-0094-4

Figley, C. R. (1995). Compassion fatigue as secondary stress disorder: An overview. In C. R. Figley (Ed.), *Coping with secondary traumatic stress disorder in those who treat the traumatized* (pp.1-20). New York: Brunner/Mazel.

Figley, C. R. (1999). Compassion Fatigue: toward a new understanding of the cost of caring. In B. H. Stamm (Ed.), *Secondary traumatic stress: Self-care issues for clinicians, researchers, & educators* (2nd ed.) (pp. 3-28). Lutherville, MD: Sidran.

Figley, C. R. (2002). Compassion fatigue: Psychotherapists' chronic lack of self-care. *Journal of Clinical Psychology, 58*, 1433-1441. doi: 10.1002/jclp.10090

Hermandez, P., Gangsei, D., & Engstrom, D. (2007). Vicarious resilience: a new concept in work with those who survive trauma. *Family Process, 46*, 229-241. doi: 10.1111/j.1545-5300.2007.00206.x

Huggard. P. K., Stamm, B. H., & Pearlman, L. A. (2013). Physician stress: Compassion satisfaction, compassion fatigue and vicarious traumatization. In C. R. Figley, P. K. Huggard & C. Rees (Eds.), *First do no self-harm* (pp.127-145). New York: Oxford University Press.

Huggard, P.K. & Huggard, E.J. (2008). When the caring gets tough: Compassion fatigue and veterinary care. *VetScript, 21,* 14-16. www.sciquest.org.nz/elibrary/edition/4443

Ismayilov, E. (2013). *Stress, burnout and stressors in volunteers working with refugees: A longitudinal study of compassion satisfaction and compassion fatigue. A dissertation submitted in partial fulfilment of the requirements for the Master of Public Health at Auckland University.* Auckland, New Zealand: The University of Auckland.

Jenkins, S. R., & Baird, S. (2002). Secondary traumatic stress and vicarious trauma: A validational study. *Journal of Traumatic Stress, 15*, 423-432. doi: 10.1023/a:1020193526843

Ioannidis, J. P. A., Patsopoulos, N. A., & Rothstein, H. R. (2008). Reasons or excuses for avoiding meta-analysis in forest plots. *British Medical Journal, 336*, 1413-15. doi: 10.1136/bmj.a117

Keyes, K. M., Hatzenbuehler, M. L., & Hasin, D. S. (2011). Stressful life experiences, alcohol consumption, and alcohol use disorders: the epidemiologic evidence for four main types of stressors. *Psychopharmacology, 218*, 1-17. doi: 10.1007/s00213-011-2236-1

McCann, I. L., & Pearlman, L. A. (1990). Vicarious traumatization: A framework for understanding the psychological effects of working with victims. *Journal of Traumatic Stress, 3*, 131-149. doi: 10.1007/bf00975140

Moher, D., Cook, D. J., Eastwood, S., Olkin, I., Rennie, D., Stroup, D. F., & QUOROM Group (1999). Improving the quality of reports of meta-analyses of randomised controlled trials: The QUOROM statement. *The*

Lancet, 354, 1896-1900. doi: http://dx.doi.org/10.1016/s0140-6736(99)04149-5

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Medicine, 6*. http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1000097

Montori, V. M., Swiontkowski, M. F., & Cook, D. J. (2003). Methodologic issues in systematic reviews and meta-analyses. *Clinical Orthopaedics and Related Research, 413*, 43-54. doi: 10.1097/01.blo.0000079322.41006.5b

Neria, Y., Nandi, A., & Galea, S. (2008). Post-traumatic stress disorder following disasters: a systematic review. *Psychological Medicine, 38*, 467-80. doi: 10.1017/s0033291707001353

Nimmo, A. (2011). *Compassion fatigue, vicarious trauma and secondary traumatic stress among professionals within health and education: A structured literature review and review article. A thesis submitted in partial fulfilment of the requirements for the Bachelor of Public Health (Honours) Degree at Auckland University.* Auckland, New Zealand: The University of Auckland.

Nimmo, A., & Huggard, P. (2013). A systematic review of the measurement of compassion fatigue, vicarious trauma and secondary traumatic stress in physicians. *Australasian Journal of Disaster and Trauma Studies, 2013*, 37-44. trauma.massey.ac.nz/issues/2013-1/AJDTS_2013-1_Nimmo.pdf

North, C. S., Kawasaki, A., Spitznagel, E. L., & Hong, B. A. (2004). The course of PTSD, Major depression, substance abuse, and somatization after a natural disaster. *Journal of Nervous & Mental Disease, 192*, 823-29. doi: 10.1097/01.nmd.0000146911.52616.22

Pearlman, L. A., & Saakvitne, K. W. (1995). Treating therapists with vicarious traumatization and secondary traumatic stress disorders. In C.R. Figley (Ed.), *Compassion fatigue: Coping with secondary traumatic stress disorder in those who treat the traumatized.* (pp.150-177). New York: Brunner/Mazel.

Pearlman, L. A., & Caringi, J. (2009). Living and working self-reflectively to address vicarious trauma. In C.A. Courtois & J.D. Ford (Eds.), *Treating complex traumatic stress disorders: An evidence based guide.* (pp. 202-234). New York: Guilford Press.

Perkins, E. B., & Sprang, G. (2013). Results from the Pro-QOL-IV for substance abuse counselors working with offenders. *International Journal of Mental Health and Addiction, 11*, 199-213. doi:10.1007/s11469 -012-9412-3.

Rudolph, J. M., Stamm, B. H., & Stamm, H. E. (1997). *Compassion fatigue. A concern for mental health policy, providers and administration.* Poster presented at the 13th Annual Meeting of the International Society for Traumatic Stress Studies, Montreal, PQ, Canada. https://www.istss.org/meetings-events/meeting-archives/2007-annual-meeting-archives.aspx

Severn M. S., Searchfield G. D., & Huggard P. (2012). Occupational stress amongst audiologists: Compassion satisfaction, compassion fatigue, and burnout. *International Journal of Audiology*, *51*, 3-9. doi: 10.3109/14992027.2011.602366

Sprang, G., Clark, J. J., & Whitt-Woosley, A. (2007). Compassion fatigue, compassion satisfaction, and burnout: Factors impacting a professional's quality of life. *Journal of Loss and Trauma, 12*, 259-280. doi: 10.1080/15325020701238093

Stamm, B. H. (2010). *The concise ProQOL manual.* Pocatello, ID: ProQOL. https://nbpsa.org/images/PRP/ProQOL_Concise_2ndEd_12-2010.pdf

Stewart, S. H., Mitchell, T. L., Wright, K. D., & Loba, P. (2004). The relations of PTSD symptoms to alcohol use and coping drinking in volunteers who responded to the Swissair Flight 111 airline disaster. *Journal of Anxiety Disorders, 18*, 51-68. doi: 10.1016/j.janxdis.2003.07.006

Thomas, R. B., & Wilson, J. P. (2004). Issues and controversies in the understanding and diagnosis of compassion fatigue, vicarious traumatization, and secondary traumatic stress disorder. *International Journal of Emergency Mental Health, 6*, 81-92. www.ncbi.nlm.nih.gov/pubmed/15298079

Vachon, M. L. S., Huggard, P., & Huggard, J. (2015). Reflections on occupational stress in palliative care nursing: Is it changing? In B.R.Ferrier and N.Coyle (Eds.), *Oxford textbook of palliative nursing* (4th ed.) (pp. 969-986). New York: Oxford University Press.

Impact of riverbank erosion: A case study

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Abstract

Human displacement is liable to occur in riverside regions where people are vulnerable to riverbank erosion. This vulnerability depends on factors such as population density and the economic conditions of the region's population. Short-term socioeconomic impacts on the displaced population include loss of home, agricultural land, jobs and assets. There will also be long-term socioeconomic impacts on the displaced population, including direct impacts on their living conditions and indirect impacts on human health and development, such as schooling for children and the health of mothers and children. Generally, short-term impacts are assessed in terms of needs for ex post assistance. However, the long-term socioeconomic impacts of riverbank erosion are rarely assessed from a policy perspective. The present study assesses these long-term impacts of bank erosion along the River Ganges. Analysis of survey data showed that the long-term socioeconomic impacts are severe, including increased income, or expenditure, poverty and also human poverty, in terms of poor living conditions, health and education. This paper concludes with a discussion of rehabilitation policy based on the survey results.

Keywords: *riverbank erosion, socioeconomic impact, displacement, human poverty, rehabilitation policy*

Assessment of socioeconomic impacts is a major task in disaster management. Such an assessment helps to identify affected sectors and to quantify financials needs for recovery and reconstruction. This is a difficult task, as some of the impacts have long-term consequences, as in the case of riverbank erosion (Haque, 1997; Baki, 2014). Short-term socioeconomic impacts are loss of home, agricultural land, jobs and assets (Refugee and Migratory Movements Research Unit, 2007). Long-term socioeconomic impacts include direct effects on the living conditions of affected populations and indirect effects on human health and development, also referred to as the accumulation of human capital, which includes schooling of children and health status of mothers and children (Wisner, Blaikie, Cannon & Davis, 2003; Das, Haldar, Das Gupta & Sen, 2014).

Asia's high population density and poor economic conditions exacerbate the impacts of natural disasters. A considerable section of the population lives along the banks of meandering rivers and in other high-risk zones. People who live near riverbanks are often the victims of bank erosion which threatens their personal safety and shelter as well as sources of their livelihoods (Brouwer, Aftab & Brander, 2006). India is no exception. Poverty drives many residents to live on increasingly eroded riverbanks, causing them to be repeatedly displaced. The settlements they live in are extremely humid (Jolly, 2013). The populations living there nonetheless seem willing to bear the impacts of recurrent natural hazards (United Nations International Strategy for Disaster Reduction, 2008).

The worst examples of riverbank erosion in India, with the most severe long-term impacts on human life, are found mainly along the Ganges and Brahmaputra rivers. The Ganges is a long river flowing through many Indian states and carrying a very large volume of water. However, there are only a few places affected by severe erosion. Flooding and erosion problems are most

serious in the lower reaches of the Ganges, particularly in West Bengal.

Especially over the last few decades, the Ganges has frequently changed course along the northern river-front of West Bengal. According to Sihha and Ghosh (2011), this is largely due to unabated bank erosion. In Malda district, upstream of the Farakka Barrage, the river has suffered extensive erosion along its left bank, even though it has been strongly protected over the same period. This kind of severe erosion is widespread throughout the river's course in West Bengal. One of the main reasons for this is the Farakka Barrage, a dam on the Bhagirathi River in West Bengal, about 10 kilometres from India's border with Bangladesh. The dam was built to divert water from the Ganges to the Hooghly River during the dry season, to flush out the silt from Kolkata harbour. It is now generally accepted that the Farakka Barrage has increased the intensity of bank erosion on the Ganges in West Bengal (Rudra, 2010). This is highly problematic where, according to official reports, an average of eight square kilometres of West Bengal is engulfed by the Ganges each year.

Countries are affected by riverbank erosion to different extents, leading to varying degrees of landscape degradation and environmental and socioeconomic impacts. In Papua New Guinea, for example, people have been displaced permanently due to the erosion of the Busu River (Sekac & Jana, 2014). In Serbia, erosion of the banks of the Kolubara River has had an impact on the agricultural population and settlements (Dragicevic, Tosic, Stepić, Živković & Novković, 2013). The loss of agricultural land to erosion along the Nile in Africa has led to a reduction in agricultural production (Ahmed & Fawzi, 2009). Riverbank erosion is also observed on the Waikato, Avon and Heathcote rivers in New Zealand (Mabin, 2007; Roper-Lindsay, 1994); the Mississippi, Missouri and Haw rivers in the United States (Briaud et al., 2007; Macfall, Robinette & Welch, 2014); the Murray, Darling and Gordon rivers in Australia (Hughes & Prosser, 2003; Bradbury, 2013); and the River Danube in Europe (Jones, Eldridge, Pedro Silva & Schiessler, 2007; Szalai, Balogh & Jakab, 2013). In some of the above cases, erosion has led to the loss of farmland and threatened roads, houses and a range of riverside services. In all cases, the extent of impacts on human settlements in any riverbank erosion situation depends on the population density and economic conditions of the people in that region. Table 1 shows that people in countries with a higher population density and lower per capita income are at higher risk of natural disasters. Risk in this table has been determined on the basis of each country's vulnerability and exposure to natural hazards (Butenop et al., 2013).

Table 1.
Population Density and Economic Conditions in Different Countries

Countries	Population density (people per sq. km of land area)[1]	Per capita income (international dollars)[2]	Disaster risk (%)[3]
Australia	3	47,389	4.51
Bangladesh	1,237	3,607	19.81
Egypt	92	11,850	2.34
Germany	234	46,893	3.24
Hungary	109	26,222	5.69
India	441	6,162	7.17
New Zealand	17	36,172	4.69
Nigeria	200	6,108	8.32
Papua New Guinea	17	2,652	15.90
Serbia	81	13,671	7.53
United States	35	55,805	3.99
Vietnam	296	6,024	12.81

Sources: [1]World Bank (2017); [2]International Monetary Fund (2016); [3]Butenop et al. (2013)

Objective of the Study

Unlike other natural disasters, there is very little quantitative information on the long-term socioeconomic impacts of riverbank erosion. The present study represents an attempt to remedy this. From a broader perspective, long-term impacts include not only income or expenditure poverty but also damage to other aspects of human development, like health, education and living conditions (United Nations Development Programme, 2010). The United Nations Development Programme (UNDP) (2010) have assessed long-term socioeconomic impacts using the following indicators:

(a) Economic conditions
(b) Access to better living conditions
(c) Educational attainment
(d) Health conditions

Indicator (a) has been evaluated using occupational patterns and poverty indices. Indicator (b) has been assessed by observing the structure of houses, the existence of improved sanitation, the use of clean energy and safe drinking water, the possession of vehicles, etc. School enrolment data and data concerning minimum years of school education constitute indicator (c).

Indicator (d) has resulted from assessing the nutritional status of mothers.

The present study is based on protocol development and a field survey carried out in 2014 and 2015. This methodology appears to usefully assess the long-term socioeconomic impacts of riverbank erosion in vulnerable regions. It may be useful for framing and implementing an appropriate rehabilitation policy for displaced people. Such a policy would embrace both short-term ex post assistance and the long-term rehabilitation of homeless and landless people who are deprived in terms of the above four indicators (Brookings-Bern Project on Internal Displacement, 2008).

Method

Five community development (CD) blocks on the left bank of the River Ganges in Malda district were affected by erosion at the time of this study. The most affected CD blocks were Manikchak, Kaliachak-1 and Kaliachak-2. The Development and Planning Department (2007) reported that the inhabitants of 236 riverine villages had lost their arable land holdings and that nearly 38,319 acres of prime cropland had been swallowed by the River Ganges, as shown in Table 2. Displaced families were resettled at several sites in Manikchak and Kaliachak-2 CD blocks. Out of these two CD blocks as shown in Figure 1, Kaliachak-2 was selected for the field survey. Exact statistics on resettled households in this CD block were not obtained. However, a survey using global positioning system (GPS) loggers (Borderon, Kienberger, Kumar, Oliveau & Das, 2017) had provided information on the spatial distribution of the resettled households in Kaliachak-2.

Table 2.
Estimated Impact of Riverbank Erosion in Malda District

CD Block	Total Area Eroded [acres]	Total Number of Families who Have Lost Land
Manikchak	13204.02	3330
Kaliachak (1 and 2)	25114.67	7378
Total	38318.69	10708

Source: Development and Planning Department (2007)

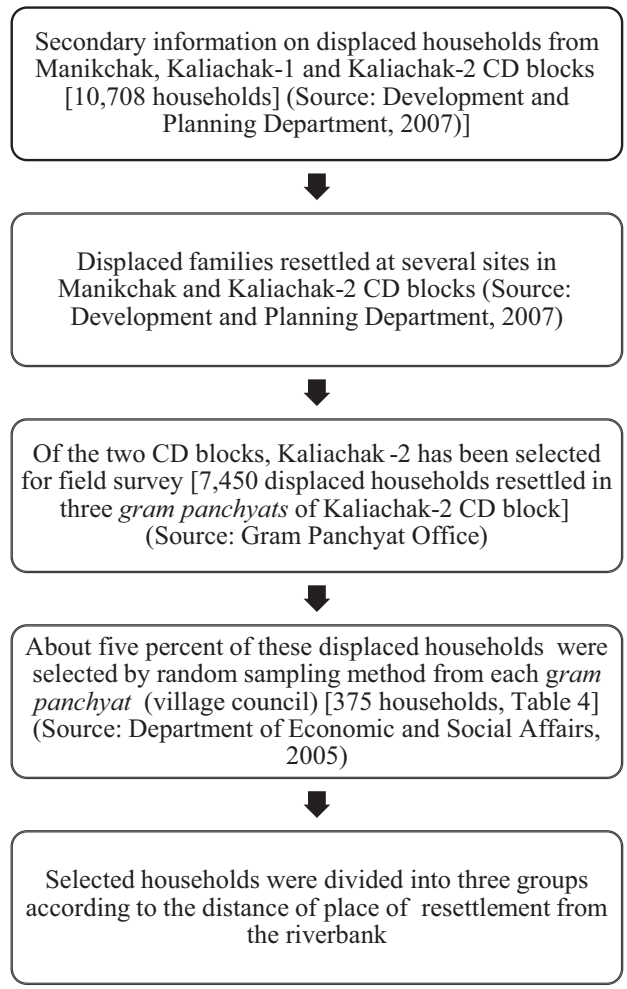

Figure 1. Study methodology

Unpublished data from the *gram panchayat* (village council area) office were used for household sampling in Kaliachak-2. This data is shown in Table 3. About 7,500 displaced households were resettled in Uttar Panchanadpur-1, Uttar Panchanadpur-2 and Bangitola *gram panchayat* of Kaliachak-2 CD block. About five percent of these displaced households from each *gram panchayat* were surveyed using a random sampling method. The survey was based on a comparatively small sample size, instead of a sample size determined for one particular indicator, for example, the income sample used by the Department of Economic and Social Affairs (2005). Instead, the

Table 3.
Number of Households in Gram Panchayet Taking Refuge from Riverbank Erosion

Zila Parisad (District Council)	CD Block	Gram Panchyet	Total Households (HHs)	Number of Original HHs	Number of Displaced HHs
Malda	Kaliachak-2	Uttar Panchanadpur-1	4100	660	3440
		Uttar Panchanadpur-2	3115	2740	360
		Bangitola	7220	3540	3680
TOTAL		3 GPs	14435	6985	7450

present study focuses on several indicators: household expenditure, educational level, and health status.

The current paper refers to households used as proxies for internally displaced persons (IDPs). These households were divided into three groups according to the distance between their place of resettlement and the riverbank. In the selected sample, nearly 46 percent of displaced households were living within one kilometre of the riverbank. Nearly 26 percent were living within 1 to 3 kilometres, and 28 percent were resettled more than 3 kilometres from the riverbank. The displaced households were grouped as follows:

Group I: Resettled within 1 kilometre of the riverbank

Group II: Resettled 1-3 kilometres from the riverbank

Group III: Resettled more than 3 kilometres from the riverbank

This study commenced on the first of March 2015, after receiving ethical clearance from Jadavpur University.

Analysis

The simplest proxy for measuring deprivation is unidimensional income, or expenditure, poverty. According to this measure, a person is poor if their consumption or income level falls below the minimum that is necessary to meet basic needs. This minimum level is usually called the *poverty line*, *subsistence level* or *threshold level* of income or expenditure and varies across time and place. One widely used measure of income, or expenditure, poverty is the head count ratio or index (HCR), which measures the proportion of the population that is counted as poor. Two advantages of this measure are that it is simple to construct and easy to understand. However, the HCR has also been criticized for failing to reflect the depth and severity of poverty. On the other hand, the poverty gap index (Sen, 1976) and the Foster-Greer-Thorbecke (FGT) index (Foster, Greer & Thorbecke, 1984) both attempt to address the severity and depth of poverty. The above three indices are calculated as follows.

HCR measures the proportion of the population that is counted as poor. Mathematically, it can be expressed as:

$$P_h = \frac{1}{N} \sum_{i=1}^{N} I(y_i < z) = \frac{n^*}{N}$$

where $I(\cdot)$ takes on a value of 1 if expenditure y_i, called the welfare indicator, is less than the poverty line z. Otherwise it takes on a value of 0. N = total population; z = poverty line; $n^* = N_p$ = number of poor in population.

The poverty gap index measures the extent to which individuals on average fall below the poverty line, and is expressed as:

$$P_g = \frac{1}{N} \sum_{i=1}^{N} \left(\frac{z-y_i}{z}\right) I(y_i < z) = \frac{1}{N} \sum_{i=1}^{N_p} \left(\frac{z-y_i}{z}\right) = HCR.R$$

It is also called the depth of poverty index, where:

$$HCR = \frac{n^*}{N} \text{ and } R = \left(\frac{z-\overline{y_p}}{z}\right)$$

The FGT index is a general formula for gauging poverty, calculated as:

$$P_{FGT} = \frac{1}{N} \sum_{i=1}^{Np} \left(\frac{z-y_i}{z}\right)^{\alpha}$$

This formula uses α as the sensitivity parameter, with the advantage that this can take into account both the poverty gap and inequality among the poor. Inequality among the poor is captured through the distributional changes within the poor segment of the population. If α=0, P_{FGT} represents head-count ratio (HCR) and if *α*=1, P_{FGT} indicates the poverty gap index.

In the same way, if *α*=2, the FGT index indicates the severity of poverty. This is also called the squared poverty gap index. This means that, for *α*=2:

$$P_{FGT} = (HCR).[R^2 + (1-R)^2.(CVP)^2]$$

Here, *CVP* measures the coefficient of variation of income of the poor. This formula is used if the policy is to minimize this inequality. However, the formula is not widely used in this way because it is not easy to interpret. In sum, the FGT index can indicate prevalence, depth and severity of poverty if *α*=0, 1 or 2 respectively. This measure shows how much would have to be transferred to the poor to bring their incomes or expenditures up to the poverty line. Therefore, it can be interpreted as the cost of eliminating poverty relative to the poverty line.

Measures of poverty using income or expenditure reflect one side of the socioeconomic impact of a disaster. Non-income measures of poverty, such as human poverty, represent another aspect of long-term socioeconomic impacts. Human poverty comprises deprivation in several basic dimensions of human development. Various indicators have been suggested to measure human poverty. In this paper, however, human poverty is indicated by descriptive statistics. These take into account the long-term socioeconomic impact across the fields of health, education and standard of living. Access to better life conditions represents standard of living. Percentage of displaced persons enrolled in schools and having completed five years of education by age group represents access to education. Nutritional status of mothers in households represents access to healthcare.

A common anthropometric indicator for adult nutritional status is *body mass index* (BMI). This index is simply calculated as the body weight (in kilograms) divided by the square of the height (in metres). The nutritional status of a person is determined as follows:

– A person is said to be suffering from mild malnutrition if 17.0 ≤ BMI < 18.5
– A person is said to be suffering from moderate malnutrition if 16.0 ≤ BMI < 17.0
– A person is said to be suffering from severe malnutrition if BMI < 16.0
– The nutritional status of a person is said to be normal if BMI ≥ 18.5

If BMI exceeds 24.9 then a person would be categorized as overweight, while a BMI of 30 or above is categorized as obese. Regardless of category, due to differences in muscle mass and genetic predispositions, the BMI is most useful for studying populations rather than discrete individuals.

Results and Discussion

Displaced households in Malda district inhabited unauthorized places such as roadsides and private mango orchards. Some of them, however, stayed near the riverbank in spite of the risk of further erosion. The households who resettled near the riverbank were more dependent on the river. Their river-dependent occupations included fishing and the cultivation of fertile riverbank soil. It was noted that most of them did not own any agricultural land. The newly emerged fertile land along the river was not demarcated and ownership had not been established. The displaced people were cultivating this land on a temporary basis (Kumar-Rao, 2015), but they failed to disclose this in the survey, most probably because their activities were unauthorized. The occupational pattern of displaced persons according to distance from the riverbank is shown in Table 4.

It is interesting to note that the occupational pattern of the displaced persons changed considerably as they shifted further from the riverbank. *Other* occupations include rickshaw/van-pulling, vending, etc. Such job opportunities were available as they moved nearer to towns or market centres. Those types of jobs were not well specified and seasonal, for example: During the mango season.

These occupations provided displaced households with a livelihood. Field surveys have been conducted in rural areas in the state of West Bengal. The poverty line in the rural areas of this state was found to be 934.10 Indian rupees per capita per month (Planning Commission, 2014). This figure was used for poverty analysis in the current study. Economic deprivation was observed through the poverty indices shown in Table 5. The poverty level of the three groups was more or less same, especially in terms of *squared poverty gap index*, or severity of poverty. Group-I IDPs were somewhat better-off in terms of the three indices. This is one reason why displaced people preferred to resettle near the riverbank. The Group-II IDPs, most of whom were engaged in day-labour, were observed to be in the worst situation.

Regarding living conditions, all the households in the survey had electric power. However, the roads through their villages were not in good condition. Even the major roads for accessing these villages were almost impassable during the three to four months of the monsoon. The main source of drinking water was tube-wells. However, during the monsoon season some households, mainly those near the riverbank, faced serious problems in collecting drinking water from those sources as the villages were flooded. Only firewood and dung-cakes were available for cooking fuel, rather than cleaner energy sources such as gas and electricity.

Houses were generally made of bamboo and mud. Only a few

Table 5.
Poverty Indices

Household Group	Headcount index	Poverty gap index	Squared poverty gap index
I	0.79	0.31	0.15
II	0.98	0.41	0.21
III	0.81	0.33	0.17

Table 4.
Distribution of Surveyed IDP Households Settled at Different Distances from the Riverbank and Distribution of their Occupational Pattern

Groups	Distribution of surveyed households in the sample	Occupational pattern of displaced households (%)				
		Labor	Cultivation	Fishing	Service	Others
I	173 (46.13%)	67.31	0.96*	26.92	-	4.81
II	97 (25.87%)	83.06	-	1.69	-	15.25
III	105 (28.00%)	69.70	-		1.52	28.78

Note: * This percentage appears to be an underestimate. Group-I households were reluctant to disclose their occupation as ownership of the newly emerged land was unclear.

Table 6.
Access to Better Life Conditions Among Displaced Households

Groups	Distribution of households (%)								
	Electricity	Cooking fuel (firewood)	Access to safe drinking water (tube-well)	Access to improved sanitation	Poor road condition during monsoon	Houses with cemented floor	Possession of mobile phone	Possession of motorcycle	Possession of television
I	100.00	100.00	100.00	48.94	100.00	0.00	98.34	1.06	4.26
II	100.00	100.00	100.00	79.25	100.00	3.77	100.00	1.89	0.00
III	100.00	100.00	100.00	92.98	100.00	8.77	54.39	3.51	7.02

Table 7.
Average Distance of Social Infrastructure from Villages Inhabited by Different Groups of IDPs

Groups	Distance (in km) from villages of IDPs of:							
	Primary School	High School	Higher Secondary School	Nearest Allopathic Doctor	Primary Health Centre	Rural Hospital	Sub-Divisional Hospital	Bus/ Auto/ Van Stand
I	1.24	2.01	2.02	1.30	1.26	4.22	22.19	1.57
II	0.38	1.17	1.26	0.81	0.83	2.18	16.51	0.47
III	1.15	2.57	2.54	0.89	0.61	3.96	19.21	0.14

houses, 2.45 percent of the total sample, were brick-built with a cement floor. This is shown in Table 6. None of the surveyed households possessed a sanitary latrine. Sanitation was observed to improve the further away they were from the riverbank. Less than 49 percent of households in villages near the riverbank possessed sanitary latrines, compared to 93 percent in villages more than three kilometres from the river.

All Group-II households possessed mobile phones though none of them owned a television. The reverse situation was observed among Group-III households. Only a few households among the three groups owned a motorcycle, and the number of motorcycles increased the further away they were from the riverbank. None of the surveyed households possessed any other appliances, such as a computer, refrigerator, washing machine.

The basic requirements for access to education and health services marked the presence of social infrastructure in each neighbourhood. In this regard, Group-II was in a favourable position, as shown in Table 7. There were primary schools and primary health centres (PHCs) within one kilometre of the villages occupied by Group-II households. High schools, higher secondary schools and rural hospitals were also closer to their villages. Regarding physical infrastructure, Group-III households enjoyed better transportation facilities than the other groups.

As shown in Table 8, survey data revealed that some members of displaced households had never enrolled in school, despite the existence of suitable education infrastructure. The percentage of persons in this circumstance varied according to age group. A higher level of school enrolment was observed among school-aged individuals (7-12 year and 13-18 year age groups) in Group-II, although many remained unenrolled. The group with the lowest level of enrolment was Group-I. One reason for this difference might be the lack of primary and high schools in the vicinity. A significant number of children in the 10-12 year age group had not completed five years of school education. This situation

Table 8.
Percentage of Persons Enrolled in School and Having Completed Five Years of Education by Age Group

Groups	Enrolled in school				Completed 5 years of education			
	Age Groups (in years)				Age Groups (in years)			
	7-12	13-18	19-24	25-30	10-12	13-18	19-24	25-30
I	71.60	52.27	36.11	19.51	63.89	50.00	33.33	17.07
II	91.11	76.79	35.29	4.35	80.95	76.79	35.29	4.35
III	80.77	55.26	46.88	52.63	71.43	55.26	40.63	36.84

was more marked among older age groups. Less than one-third of the population in the 19-24 age group had been to school. However, rates of school attendance were higher among Group-III households.

Data were collected to determine the nutritional status of mothers in the surveyed households, as a proxy indicator for the health of displaced persons. The BMI of mothers in every surveyed household was computed and is presented in Table 9. The computed results suggest that 14.12 percent of Group-I mothers, 12.24 percent of mothers in Group-II and 10.20 percent of those in Group-III were suffering from mild malnutrition. From the viewpoint of nutritional status as part of human poverty, the people in Group-I were the most deprived of all the displaced households in this region.

Table 9.
Body Mass Index (BMI)

Groups	Average BMI of mothers (in the age group 15-49 years)	Coefficient of BMI variation	Percentage of mothers suffering from mild malnutrition
I	22.35	18.22	14.12
II	23.20	16.36	12.24
III	21.89	15.69	10.20

The above analysis suggests that the displaced people were more or less economically poor. Their living conditions were unsatisfactory, the social infrastructure facilities in the new locations were inadequate, children remained uneducated and mothers were suffering from mild malnutrition. In sum, the IDPs were experiencing human poverty. In these circumstances, it is important to generate policies that might lead to their rehabilitation and human development.

Conclusion

Displacement takes place in regions where people are more vulnerable to natural disasters (Wisner et al., 2003). Riverbank erosion provides one example of this (Das et al., 2014). Asian countries tend to be more vulnerable to riverbank erosion due to their high population density and poor economic conditions. Large sections of the population in these countries live along the rivers and are more likely to be affected by bank erosion.

Bank erosion has both short- and long-term impacts on IDPs' livelihood. The short-term socioeconomic impact of riverbank erosion is immediate economic loss, i.e. loss of land, assets and jobs (Refugee and Migratory Movements Research Unit, 2007). Disasters also have longer-term, indirect impacts, and these are the ones that are analysed in this study, with reference to Haque (1997) and Baki (2014). The findings of the present study should be helpful in formulating appropriate rehabilitation policies in a range of regions beyond the current research context. Field survey analysis and other data showed how severe the long-term impacts of riverbank erosion can be, consisting not only of income/expenditure poverty but also of human poverty among the displaced people. Surveyed households had been forced to move from their places of origin and take shelter elsewhere. They remained uneducated, unhealthy and unemployed due to this disruption. Unhealthy mothers gave birth to undernourished children. Uneducated young people had no access to better jobs. It is important to consider that educational attainment, particularly higher education, plays a significant role in reducing income inequality (De Gregorio and Lee, 2002). Due to lack of education, it appears that the current populations displaced by riverbank erosion could hardly attain a minimum level of livelihood. Their living conditions were poor and they had no way of improving them.

The survey analysis indicated that some of the displaced persons continued to live on the riverbank, within 500 meters of the river, despite the high risk of further bank erosion and flooding. Their risk-taking behaviour can be explained by their wish to continue their previous occupations, such as fishing and the cultivation of newly emerged land. This variable phenomenon leads to multiple displacements of IDPs. IDPs who moved further away from the riverbank were forced to change their occupations, and they were economically more disadvantaged than those who stayed nearer the river. This is reflected in the poverty indices of the different communities. It therefore appears that there is a trade-off between risk-taking and income-earning.

What is the best policy to adopt in this context? *Coastal regulation zones* (CRZ) have been declared in almost all countries. However, as discussed earlier, large sections of the population in almost all Asian countries remain in high-risk zones, including the banks of meandering rivers, due to poverty and population expansion. India is no exception and relevant socio-economic policies have been put in place. It is the implementation of these policies that needs to be adjusted to offer alternative means of livelihood for vulnerable people.

There can be no doubt that people will continue to reside along riverbanks and that riverbanks will continue

to erode. Under these circumstances, there needs to be a policy in place for the rehabilitation of people affected by bank erosion, as shown in Figure 2. In India, there are policies concerning ex post assistance for people affected by natural disasters, especially floods, cyclones and earthquakes. These people receive a relief package designed to alleviate the short-term impacts, including the repair or rebuilding of their houses and compensation for damage to their crops. Policy for refugees is somewhat different. Affected people are given government assistance for housing and means of livelihood in new locations.

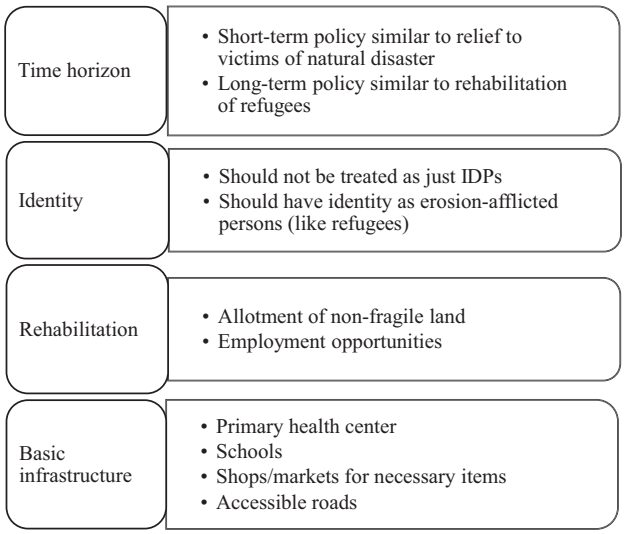

Figure 2. Policy formulation guidelines for ex-post assistance to riverbank erosion victims

The outcome for victims of riverbank erosion is similar to that for refugees. Erosion victims lose their houses and means of livelihood, including agricultural land, poultry, cottage industries and shops. Since these people are displaced, government policy should clearly define their status so that they can enjoy the same civic rights as other citizens in their country, including education, health, food, employment and voting rights. To be precise, policy should not merely be directed at ex post assistance to populations affected by natural disasters, but should also encompass the kind of rehabilitation packages that are provided for refugees when they become homeless and landless (Brookings-Bern Project on Internal Displacement, 2008).

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References

Ahmed, A. A. & Fawzi, A. (2009). Meandering and bank erosion of the River Nile and its environmental impact on the area between Sohag and El-Minia, Egypt. *Arab Journal of Geosciences*, *4,* 1-11. doi: 10.1007/s12517-009-0048-y

Baki, A. T. (2014). *Socio-economic impacts of Gorai riverbank erosion on people: A case study of Kumarkhali, Kushtia*. Retrieved from http://dspace.bracu.ac.bd/bitstream/handle/10361/3532/13372004.pdf?sequence=1

Bhattacharya, G., & Haldar, S. K. (2014). Trend, differential and determinants of deprivation of reproductive and child health in the districts of West Bengal, India. *Journal of Health Management, 16*, 93–112. doi: 10.1177/0972063413518686

Borderon, M., Kienberger, S., Kumar, S., Oliveau, S., & Das, T. K. (2017). Beyond the lack of data: How to generate spatial data on displaced populations using Global Positioning System (GPS) Loggers: The example of populations displaced due to Ganges riverbank erosion in Malda, West Bengal, India. *GI_Forum*, *1*, 360 – 368. doi: 10.1016/B978-0-323-03253-7.50055-8

Bradbury, J. (2013). *Lower Gordon river erosion monitoring, Tasmanian wilderness world heritage area. Nature conservation report series 2013/08.* Retrieved from http://dpipwe.tas.gov.au/Documents/LGR%20Monitoring-2013-14.pdf

Briaud, J. -L., Chen, H.-C., Chang, K. -A., Chung, Y. -A., Park, N., Wang, W., & Yeh, P. -H. (2007). *Establish guidance for soils properties-based prediction of meander migration rate. Technical report FHWA/TX-07/0-4378-1.* Retrieved from http://tti.tamu.edu/documents/0-4378-1.pdf

Brookings-Bern Project on Internal Displacement (2008). *Protecting internally displaced persons.* Retrieved from www.refworld.org/pdfid/4900944a2.pdf

Brouwer, R., Aftab, S., & Brander, L. (2006). *Socio-economic vulnerability and adaptation to environmental risk: A case study of climate change and flooding in Bangladesh. PREM working paper 06/01.* Retrieved from http://www.prem-online.org/archive/16/doc/PREM06-01.pdf

Butenop, J., Kistemann, T., Marx,, M., Mucke, P., Radtke, K., Schmitz, P., … Wolfertz, J. (2013). *World risk report 2013.* Retrieved from https://i.unu.edu/media/ehs.unu.edu/news/3772/11644.pdf

Das, T. K., Haldar, S. K., Das Gupta, I., & Sen, S. (2014). River bank erosion induced human displacement and its consequences. *Living Review of Landscape Research*, *8*, 1-35. doi: 10.12942/lrlr-2014-3

De Gregorio, J. D., & Lee, J. W. (2002). Education and income inequality: New evidence from cross-country data. *Review of Income and Wealth*, *48*, 395-416. doi: 10.1111/1475-4991.00060

Department of Economic and Social Affairs (2005). *Designing household survey samples: Practical guidelines, studies in methods. Series F, No. 98*, New York: The United Nations. Retrieved from http://unstats.un.org/unsd/demographic/sources/surveys/Series_F98en.pdf

Development and Planning Department (2007). *District human development report: Malda*. Retrieved from www.bplan.

gov.in/htm/HumanDev/Human%20Development%20Malda.pdf

Dragicevic, S., Tosic, R., Stepić, M., Živković, N., & Novković, I. (2013). Consequences of the river bank erosion in the southern part of the Pannonian Basin: Case study – Serbia and the Republic of Srpska. *Forum Geografic*, *XII*, 5–15. doi: 10.5775/fg.2067-4635.2013.008.i

Foster, J., Greer, J., & Thorbecke, E. (1984). A class of decomposable poverty measures. *Econometrica*, 52, 761–766. doi: 10.2307/1913475

Haque, C. E. (1997). *Hazards in a fickle environment: Bangladesh*. New York: Springer Science & Business Media. Retrieved from https://books.google.co.in/books?id=Z8fOvFD6z44C&redir_esc=y

Hughes, A. O., & Prosser, I. P. (2003). *Gully and riverbank erosion mapping for the Murray-Darling Basin. Technical report 3/03, March*. Canberra, Australia: CSIRO Land and Water.

International Monetary Fund (IMF) (2016). *World economic outlook database*. Retrieved from https://www.imf.org/external/pubs/ft/weo/2016/01/weodata/index.aspx

United Nations International Strategy for Disaster Reduction (UNISDR) (2008). *Linking disaster risk reduction and poverty reduction*. Geneva, Switzerland: United Nations.

Jolly, A. (2013, August 12). A day in the life of India's poorest. *India Today*. Retrieved from http://indiatoday.intoday.in/story/murshidabad-india-poverty-in-india/1/297697.html

Jones, W., Eldridge, J., Pedro Silva, J., & Schiessler, N. (2007). *LIFE and Europe's rivers: Protecting and improving our water resources.* Luxembourg: European Communities.

Kumar-Rao, A. (2015, March 28). *Photo essay:* The nowhere people. *Live Mint*. Retrieved from http://www.livemint.com/Leisure/B9LMeb4sm3FCi1Bv1ex3yM/Photo-Essay-The-nowhere-people.html

Mabin, M. (2007). *Waikato river bank erosion study Volume 1*. Retrieved from www.waikatoregion.govt.nz/PageFiles/11266/Waikato%20River%20erosion%20study.pdf

Macfall, J., Robinette, P., & Welch, D. (2014). Factors influencing bank geomorphology and erosion of the Haw River, a high order river in North Carolina, since European settlement. *PLoS One*, *9*. doi: 10.1371/journal.pone.0110170

Planning Commission (2014). *Report of the expert group to review the methodology for measurement of poverty.* Retrieved from http://planningcommission.nic.in/reports/genrep/pov_rep0707.pdf

Refugee and Migratory Movements Research Unit (2007). *Coping with riverbank erosion induced displacement*. *Policy brief.* Retrieved from www.migrationdrc.org/publications/briefing_papers/RMMRU/Policy_brief_ISSUE_1.pdf

Roper-Lindsay, J. (1994). Tales of the riverbank – examples of bank restoration on urban rivers in restoration of aquatic habitats. In K. J. Collier (Ed.), *Restoration of aquatic habitats* (pp. 125-143). Wellington, New Zealand: Department of Conservation.

Rudra, K. (2010). Dynamics of the Ganga in West Bengal (1764–2007): Implications for science–policy interaction. *Quaternary International*, *227*, 161–169. doi: 10.1016/j.quaint.2009.10.043

Sekac, T. & Jana, S. K. (August 2014). Change detection of Busu river course in Papua New Guinea- impact on local settlements using remote sensing and GIS technology. *International Journal of Scientific & Engineering Research*, *5,* 891-899. https://www.researchgate.net/publication/304216714

Sen, A. K (1976). Poverty: An ordinal approach to measurement. *Econometrica, 44*, 219-231. doi: 0012-9682(197603)44:2<219:PAOATM>2.0.CO;2-Z

Sinha, R., & Ghosh. S (2011). Understanding dynamics of large rivers aided by satellite remote sensing: a case study from Lower Ganga plains, India. *Geocarto International, 27*, 207-219. doi: 10.1080/10106049.2011.620180

Szalai, Z., Balogh, J., & Jakab, G. (2013). Riverbank erosion in Hungary – with an outlook on environmental consequences. Hungarian *Geographical Bulletin, 62*, 233–245. https://www.researchgate.net/publication/258447536_Riverbank_erosion_in_Hungary_-_With_an_outlook_on_environmental_consequences

UNDP (2010). *Human development report 2010.* Retrieved from http://hdr.undp.org/sites/default/files/reports/270/hdr_2010_en_complete_reprint.pdf

Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2003). *At risk: Natural hazards, people's vulnerability and disasters* (Second edition). London and New York: Routledge

World Bank Group (2017). *World development indicators.* Geneva, Switzerland: The World Bank

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Assessing research priorities and practices following the 2016 Kaikoura Earthquake

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Abstract

A disaster event is an opportunity for researchers to inform recovery efforts and to learn more about disaster impacts, response and recovery. It is also an important time to reflect on how well the research community is working together to inform policy and practice to reduce the impacts of future disaster events. Following the 2016 Kaikoura earthquake, social science researchers and disaster management practitioners gathered from across New Zealand to discuss these issues. Participants identified immediate needs in collecting perishable data related to understanding earthquake impacts, recovery best practice, and collaboration and engagement practices. They also identified the need for the social science community to improve their effectiveness in a post-disaster environment, to maximise impact and minimise community disruption. A set of principles for best practice post-disaster research have been proposed.

Keywords: *Post disaster research; research practice; collaborative research*

Following any disaster event there is a desire by the social science research community to both inform recovery efforts and learn from the event. However, social science researchers may also need to keep their distance from communities and recovery authorities who are under immense pressure to deal with immediate recovery needs. There is also a focusing effect of disasters, where there may be a greater likelihood of collaboration between scientists and policy makers, but also a chance that research may be duplicated due to escalating research efforts (Beaven, Wilson, Johnston, Johnston, & Smith, 2016). When New Zealand was impacted by the 2016 Kaikoura earthquake, a group of New Zealand-based researchers gathered professionals interested in post-disaster social science research, for a workshop to ascertain immediate and ongoing research needs while identifying how research practices could contribute to earthquake recovery. They held the Kaikoura Earthquake Social Science Research Workshop on the 24th of February 2017 in Wellington (NZ). The precise aims of the workshop were to:

1) Bring researchers together to identify potential collaboration opportunities
2) Prioritise and focus immediate and on-going research efforts
3) Reflect on the effectiveness of social science research efforts in informing disaster practice

The current research update begins by describing the Kaikoura earthquake context and the workshop process. Next, research priorities are discussed, followed by a set of principles developed for improving post-disaster research practice.

The Kaikoura Earthquake

The Kaikoura Earthquake is the name given to a M7.8 earthquake that occurred in New Zealand on November 14, 2016. An initial rupture in Culverden triggered a domino effect of sequential of fault ruptures stretching 150km north east of the epicentre (Balfour, 2016).

As illustrated by Figure 1 the effects of this event were felt across a wide area of the upper South and lower North Island of New Zealand. Two people in North Canterbury died as a result and hundreds were injured, with extensive damage to many residential and commercial buildings. Road and rail closures occurred throughout North Canterbury due to a combination of landslips and uplift. These closures cut-off road and rail into Kaikoura, a small coastal, tourist town on the east coast of the South Island, *Te Waipounamu*. They also stranded several hundreds of tourists and locals who were eventually evacuated by sea and air (Young, 2016). Small communities across rural North Canterbury, most

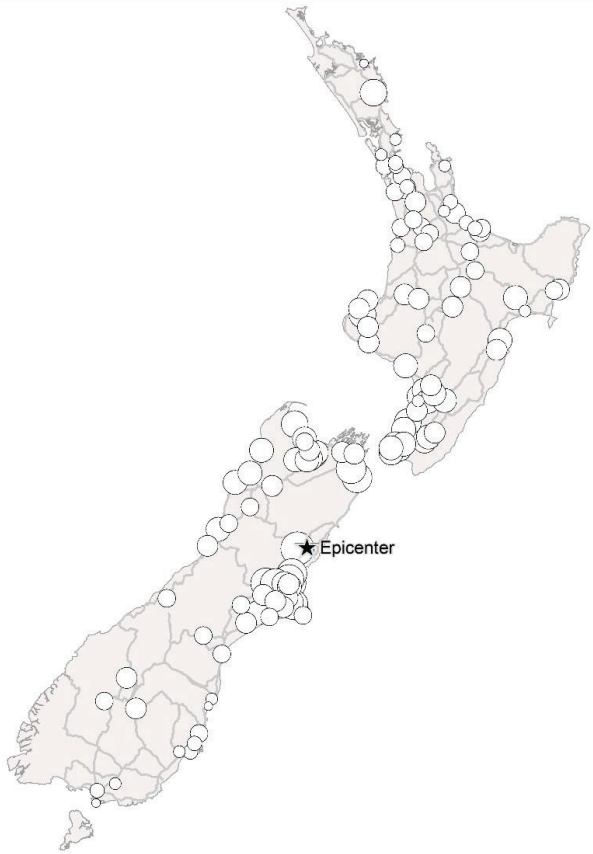

Figure 1. Shaking intensity reported by the public using GeoNet Felt Reports following the Kaikoura earthquake. Reproduced from Felt Reports by GeoNet, 2016, Wellington, New Zealand. Copyright 2016 by the Earthquake Commission and GNS Science. Reproduced with permission.

notably in Waiau and Cheviot, experienced damage to community and residential structures and disruptions to water and electricity supplies.

An estimated 4.1 metre tsunami wave was generated in Little Pigeon Bay on Banks Peninsula immediately south of Christchurch, destroying an unoccupied holiday home (Little, 2016). Although the damage caused by this tsunami was relatively contained, inconsistent evacuation orders issued by local Civil Defence and Emergency Management offices caused confusion among the public (Perry, 2016).

In the North Island, structures in the Wellington city centre and Lower Hutt commercial centre were eventually condemned and then demolished (Cook, 2016). The total of direct costs from the Kaikoura Earthquake event have been estimated at 2-3 billion New Zealand dollars (The Treasury, 2016).

Following the 2010 and 2011 Canterbury earthquakes, the New Zealand research community became familiar with the importance of triaging science priorities, in a similar way to triaging casualties by urgency. In terms of research needs, the geotechnical research community was a notable *first responder* following the Kaikoura events in 2016. Within two days of the Kaikoura earthquake a group of collaborators[1] from within this community had created a Google Drive to collate and share data, reconnaissance reports, and information sheets as they eventuated. Other researchers had begun contributing to an event-specific, geospatial web portal being hosted by the Earthquake Commission (EQC) and Tonkin & Taylor. They had also established the Kaikoura Earthquake Virtual Clearinghouse website, for publishing information relevant to the public and to international researchers (EERI, 2016). This effort met many immediate information needs for decision makers and practitioners attempting to understand the dynamic geophysical environment and its impact on local response and recovery planning. These platforms also allowed scientists to collect large amounts of perishable data that would inform future research efforts.

Lessons from the Canterbury earthquakes had informed the decision among researchers within the four major funding structures for hazards research in New Zealand, GNS science, the New Zealand Centre of Research Excellence for Earthquake Resilience (QuakeCoRE), the Resilience to Nature's Challenge National Science Challenge, and the Natural Hazards Research Platform, to proactively coordinate research in the natural and social sciences. The focus of these early coordination efforts was to:

– minimise the number of transactions with researchers
– minimise requests for information from affected communities and responding agencies
– identify perishable data collection needs, and to
– reduce research duplication.

The Workshop Process

Organising body

The Kaikoura Earthquake Social Science Workshop was enabled by highly networked researchers within the four main natural hazards research funding structures. Funding for organisation, venue, travel support and

1 The collaborators included researchers and practitioners from GNS Science (a New Zealand Crown Research Institute), New Zealand universities working with QuakeCoRE, and the New Zealand Society for Earthquake Engineering (NZSEE) with support from the Earthquake Commission (EQC).

some logistical costs was provided by Quake CoRE[2]. In-kind funding for organisers' time was provided by the Natural Hazards Research Platform[3] and the Resilience to Nature's Challenges[4] programme.

Recruitment of Attendees

Invitations to the workshop were sent to active New Zealand social science researchers with a known interest in disaster recovery. The workshop was also advertised on New Zealand research network websites. Invited individuals were encouraged to forward the workshop details to their networks, to broaden coverage. Workshop organisers also used their personal networks to involve response and recovery practitioners throughout the impacted area, to encourage representation of potential research end-users and practice-oriented stakeholders.

There was a total of 50 workshop participants and two workshop organiser/facilitators. Of those, 40 attendees considered themselves researchers with an interest in Kaikoura's earthquake response or recovery. The 10 attendees that did not fit in this category included representatives from local or regional councils (n = 4), a Government agency (n = 1), civil defence and emergency management personnel (n = 2), iwi[5] representative (n = 1), agricultural industry representative (n = 1), and two researchers with a general interest in post-disaster or social science research but no specific research interest in Kaikoura (n = 2). The 40 attendees that were interested in conducting social science research in Kaikoura were from academia, crown research institutes, government agencies, and private industry.

To facilitate additional participation, an online survey was sent to people interested in Kaikoura-earthquake related social science through the same channels used to invite workshop participants. The survey had 40 responses. Of those, 13 people did not attend the workshop, while 27 both attended the workshop and answered the survey.

Finally, all workshop participants were asked to answer this question via email: What do you think the number one social science research priority is for the Kaikoura earthquakes?

The purpose of this preparatory work was to encourage participants to reflect on research needs and priorities from their own perspectives, before developing a more collaborative set of research priorities.

2 www.quakecore.nz/
3 www.naturalhazards.org.nz/
4 resiliencechallenge.nz/
5 Indigenous Māori population of New Zealand.

Workshop Format

The workshop was divided into five segments: 1) icebreaker and workshop introduction; 2) panel discussions; 3) mixed round-table discussions; 4) interest-aligned round-table discussions; and 5) closing dialogue. This structure was designed to maximise participant interaction, stimulate cross-pollination of ideas, and to expose participants to relevant past and ongoing research. First, participants shared their research priorities as part of a rapid-fire *speed-dating* style icebreaker, adapted from events where single people talk to a series of potential partners in a very short timeframe. This phase was followed by an overview of key research programmes and funders operating in this area, along with the key aims for the workshop as a whole.

The majority of the full-day workshop consisted of two panel discussions and two round-table discussions. The first panel discussion focused on current issues, challenges, and knowledge gaps relating to impacts and recovery from the Kaikoura earthquake. The invited panellists included representatives from: the Kaikoura *Runanga*, the tribal council for the *hapu* (sub-tribe) of Ngāti Kuri; the Wellington Region Emergency Management Agency; Lincoln University; and the Ministry of Primary Industries. The second panel discussion focused on the question: What have we learned from past recovery processes that is relevant to this event? Panellists addressing this question represented Beef and Lamb New Zealand, Christchurch City Council, Wellington City Council, and two Crown Research Institutes. Each panellist brought insights from previous disaster recovery processes in which they had participated as either a researcher or practitioner.

Following each panel discussion, workshop participants separated into seven *round-table* groups, with seating pre-assigned by organisers to ensure a mix of researchers and research users. Each table was asked to discuss their reflections on the panel discussion. After 20 minutes, participants were asked to move to the next set of pre-assigned tables, to commence a further 20-minute discussion on the same topic but with a different group of attendees. This structure allowed participants to engage with other participants with similar research interests and to gain exposure to a variety of research topics. The round-table sessions and the mixing of groups appeared to work well, by promoting

rich and diverse discussion among participants. This was a highlight of the workshop process.

All panellists participated in the round-table discussions and, where relevant, their responses were recorded in the results. The panel discussions were intended to frame round-table discussions including a wider range of perspectives about past and present disaster research. Though the panel discussions were not designed to set a research agenda for Kaikoura Earthquake research, the roundtable discussions did reference points from the panel discussions. It is therefore logical to assume that panellists influenced the direction of the discussions, to a limited extent.

The workshop was concluded with a whole of the room discussion, facilitated by organisers and focusing on the key messages and actions to be taken away. This phase aimed to draw together the many different conversations that had occurred throughout the day, and enable people to reflect on their learnings, observations and experience throughout the workshop. With such a large group, at the end of a long day, this session was not as lively as the round-table sessions had been. However, it was still an important part of the workshop, one that effectively brought the group together and summarised key discussions.

Workshop Findings

Research priorities

During the workshop, participants were asked to write down their answer to the preparatory question, "What do you think the number one social science research priority is for the Kaikoura Earthquakes?" Their answers were collected at the end of the workshop.

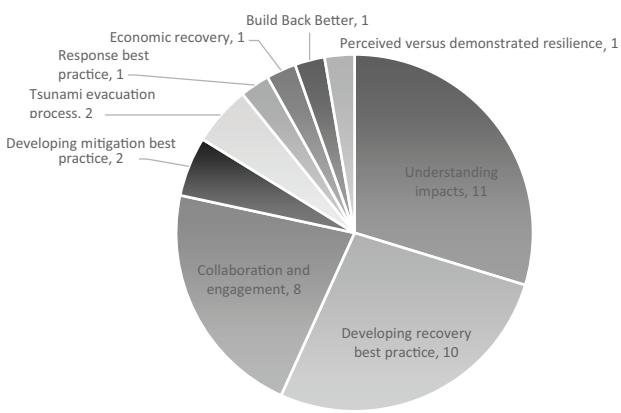

Figure 2. Priority research areas by number of participants identifying research priority

The majority of the research priorities identified by workshop participants fell under three themes, as shown in Figure 2. These themes primarily relate to advancing our understanding of earthquake events, rather than supporting real-time recovery.

The prevalent theme, understanding impacts, included work to describe and understand the social impacts of the earthquake, tsunami, and landslides. The second most common theme included all interests in elements of recovery best practice. The third most common theme covered work on the collaboration and engagement within and between communities, recovery agencies, and experts to better support recovery and future preparedness. Table 1 provides examples of participants' responses, categorised under these three main research themes.

Post-disaster researcher practices

Social science research best practice in post-disaster environments has been covered in depth, in many forums, including by Bevan et al. (2016), Collogan et al. (2004), Gill et al. (2007), and North, Pfefferbaum and Tucker (2002). This body of literature suggests that it is important for best practice to be reinforced through conversation and conscious reflection and engagement. We have identified two main themes from the workshop, relating to practicing research in a post-disaster environment: maximising research impact, and minimising disruption to affected communities. We have reframed these themes into principles for post-disaster social science research that can add to pre-existing literature informing research practice following the Kaikoura Earthquakes, future disaster events in New Zealand, and internationally.

Conclusions

The Kaikoura Earthquake Social Science Research Workshop workshop aimed to: 1) bring researchers together to identify potential collaboration opportunities; 2) prioritise and focus immediate and on-going research efforts; and 3) to reflect on the effectiveness of social science research efforts in informing disaster practice. The icebreaker, roundtables, and group discussions were designed to facilitate researcher connections across a range of institutions and disciplinary focus areas. It can therefore be assumed that the workshop achieved the first objective. However, no information was collected to determine whether the workshop stimulated ongoing collaboration.

Table 1.
Examples of Research Priorities Reported by Workshop Attendees

Theme	Respondents' research interests
Understanding impacts	Social and economic impacts of naming a disaster after a place
	The economic cost of the Kaikoura earthquake in indirectly affected communities.
	The effect on property and rent prices, and implications on urban planning?
	Business disruption in Wellington and what this might mean for a large-scale Wellington event
	The flow on impacts and distribution of these across different sectors of society or business community (e.g., freight transport impacts)
	Spatial behaviour following physical disruption
	The effect of the earthquake on livelihoods and how industries are coping
	Mental health impacts
Developing recovery best practice	Measuring the effectiveness of recovery to inform current practice and future events
	Creating and empowering locally led recovery initiatives
	The effectiveness and efficiency of communication between business, local authorities and government during the recovery
	The contrasting imperatives of centralised and decentralised recovery governance
	Comparison of the different recovery structures developed post-Kaikoura to the Canterbury model
	Developing policies that will get things fixed quickly
	The link between built environment recovery and social recovery
Collaboration and engagement	Shared community/agency planning for future disasters across the '4 Rs'
	Building on experiences of recent events and existing social capital to mitigate and increase preparedness and resilience for future
	Bringing expertise in alignment with community/organisation/business/cultural needs in Kaikoura to support understanding of resilience, what it means, how to achieve it so that it makes sense to Kaikoura people
	Bespoke needs assessment in each community or industry – understanding their priorities

Concerning the second of three workshop objectives, workshop discussions and the follow-up report produced by the facilitators after the workshop and survey were a central component of sharing different researchers' research priorities. Ultimately, these outputs tend to reflect the diversity of research interests, rather than focusing and prioritising research efforts. It does, however, appear that the workshop and subsequent outputs reduced the likelihood of redundant research occurring.

The third workshop objective was discussed generally throughout the workshop, but did not emerge as a central focus for the panel or roundtable discussions. The efficacy of social science research in disaster management could be an important topic for continued consideration. The current workshop did not generate any efficacy metrics. Best-practice guidelines outlined in Table 2 are nonetheless a step towards establishing practices that limit the negative impacts of disaster research while enhance positive outcomes for researchers and affected communities.

Meetings like the Kaikoura Earthquake Social Science Workshop allow researchers and end-users with aligned interests to connect and collaborate. This helps to reduce the risk of duplicating their research-research work and helps prevent over-researching similar populations. It also allows an opportunity to focus efforts on key research priorities, in this case: collecting perishable data related to understanding earthquake impacts, recovery best practice, and collaboration and engagement practices.

Alongside direct research priorities related to the Kaikoura Earthquakes, there was a clear need to improve the practice of post-disaster research: to improve implementation of research learnings, before and during a disaster, and to reduce the impact of research activities on communities. The recent series of large scale natural hazard events in New Zealand has been a learning and growth period for the local social science research community. Researchers now appear to more keenly aware of potential risks and benefits of conducting post-disaster research with affected communities. While lessons have been learnt, there is a clear desire to improve how we collectively respond to disaster events; and to ensure that our research is

Table 2.
Post-Disaster Social Science Research Best Practice Principles

Principle	Discussion point	Suggested Best Practice
Coordinate and collaborate to minimize social disruptions	An influx of people interested in doing research, particularly in the smaller rural communities, can often put further strain on local resources, capacities, and wellbeing.	Researchers should network and coordinate similar projects and share data, when appropriate, to make the most use of resources and of respondents' time. Connecting with NGOs and/or researchers already networks with communities and policy makers is a good way to reduce impacts on communities and improve effectiveness of research efforts.
Triage research needs to minimise social disruption	Engineers and geophysical researchers were directly engaged immediately following the Kaikoura event as a matter of life safety and access to affected areas. Social scientists with established connections to affected communities or responders were engaged to estimate economic impacts or help run community needs' assessments in the early phases of disaster response. In cases, where an immediate request was not made, social scientists were asked to delay research until the situation stabilised.	Research that will inform future mitigation, planning, and recovery actions is important, but should be considered secondary to the immediate needs and wellbeing of affected communities. Researchers should avoid "chasing ambulances" and be realistic about where and when their work will be most useful.
Support the community, don't just investigate them	Researchers can and do often successfully support response and recovery activities. Researchers can also descend on affected communities to collect data through a one-way exchange. This can leave communities feeling that they have been taken advantage of. It is important for researchers to work with communities as much as possible.	Where appropriate and welcomed, researchers can engage with communities as experts providing deep insights into disasters and can serve as a resource in a trusted advisor role. Utilise participatory processes that co-produce knowledge using feedback loops, continuity of process, and balance top-down and bottom-up - without overburdening participants. Be collaborative and output oriented by asking what does your research give back?
Recognise that all disasters and communities are different	While a considerable body of knowledge has been accumulated in New Zealand and abroad on disasters, acceptable practice, risk tolerance, and social and policy environments change over time and between places. This means "lessons learned" from previous experience are not always applicable in the current context.	Situational awareness, foresight, and local expertise have a role to play alongside lessons learned and subject-matter expertise. Research should be a dynamic process.
Capture the heterogeneity of impacts, responses, and recovery trajectories	There are diverse needs and experiences of geographically and demographically unique communities. For example, Maori cultural impacts and values, especially in recovery management, have not been well recognised to this point.	Conduct bespoke needs assessments, support inclusiveness at all stages of research, and identify meaningful ways to co-create and share research outcomes with the community.
Manage expectations	Researchers often want to understand immediate needs, but may not be equipped to help resolve those needs. Some research outputs will be provided back to affected communities, while in other cases research outputs will be distributed more generally through research reports.	Researchers need to be clear with themselves and with communities about their limitations and intentions. Researchers should be clear with participants about how the outcomes will be used and distributed. And, where possible, make outputs accessible to research participants.
Develop communication strategies that are appropriate for the intended audience	As a way to make science accessible to the public, a strategy can include describing the impacts of an earthquake on something tangible, e.g. crockery rather than probabilities and magnitude which can be too abstract. In this case an earthquake's effects would be described in terms of how much the dishes in someone's cupboard might rattle or fall for a given intensity.	When communicating with the public at large, science messaging should be clear and related to people's everyday experiences. This may mean bringing in someone with specialised communication skills. Recognise that how you frame an event can affect people's perceptions and engagement. For example, referring to the crisis period as a 'transition' or 'recovery' can have an impact.
Clearly identify intended research impact and implementation pathway	Despite several suggestions for policy-oriented and "impactful" research, a lesson from the research following the Canterbury earthquakes is that some research outputs are not politically palatable, regardless of the quality and validity of the findings. Similarly, some research outputs will not have clear immediate implications or benefits but may be insightful later on.	Have a clear plan for how to embed research findings upfront. Socialise your research early and often with the groups you hope to reach. Not all work needs to impact policy or catalyse immediate action. Some work will incrementally advance understanding in a particular field and that is an acceptable outcome.
Prepare pre-event	The Canterbury earthquakes have enabled the research community to understand and pre-prepare to respond quickly post-event – to gather data to support response agencies and to collect perishable data. Those researchers that have well established relationships with communities, authorities or policy makers pre-event are usually the most effective at supporting recovery and maximising the impact of their research.	Develop relationships with policy makers and communities prior to an event. This could be through knowledge exchange, capacity development or secondments. Take advantage of the window of opportunity when a disaster occurs, as the government is most open to new ideas when they are confronted with a major unexpected challenge.
Be aware of the psycho-social strain faced by researchers	Many in New Zealand have been working on active disasters consistently since at least the beginning of the Canterbury earthquakes in 2010. Some are expected to respond immediately as each new disaster unfolds, as a result the strain within the research community has become a pervasive issue.	Researchers and their colleagues and collaborators should monitor the psycho-social wellbeing of those doing research on disasters, and practice self-care or raise the issue with colleagues you are concerned about.

ethically sound, timely and impactful in the wake of a disaster.

The lessons learnt through the workshop and principles developed for post-disaster research will be of value for researchers in New Zealand and internationally who are preparing to respond to disaster contexts within their own communities. Researchers can take steps before an event to develop relationships and collaborations with other researchers, governing bodies and communities so that they become trusted advisors and partners throughout the response and recovery of local communities. The established and trusting relationships resulting will help enable more timely, effective and impactful post-disaster research.

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References

Balfour, N. (2016). *Watching the M7.8 Kaikoura Quake dominos fall in real time*. Retrieved from www.geonet.org.nz/news/5YRSGPHkY0mK6S4IEgs62y

Beaven, S., Wilson, T., Johnston, L., Johnston, D., & Smith, R. (2016). Research engagement after disasters: Research coordination before, during, and after the 2011–2012 Canterbury Earthquake sequence, New Zealand. *Earthquake Spectra, 32*, 713-735. doi: 10.1193/082714EQS134M

Collogan, L. K., Tuma, F., Dolan-Sewell, R., Borja, S., & Fleischman, A. R. (2004). Ethical issues pertaining to research in the aftermath of disaster. *Journal of Traumatic Stress*, *17*, 363-372. doi: 10.1023/B:JOTS.0000048949.43570.6a

Cook, F. (2016, 14 December). One-month anniversary of the 7.8 Kaikoura Earthquake. *New Zealand Herald.* Retrieved from www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11766149

EERI (2016). Kaikoura, New Zealand Earthquake Clearinghouse: M7.8 November 13, 2016, 1:02:56 UTC. *EERI Earthquake Clearinghouse.* Retrieved from http://www.eqclearinghouse.org/2016-11-13-kaikoura/

GeoNet (2016). *Felt reports*. Retrieved from api.geonet.org.nz/intensity?type=reported&publicID=2016p858000

Gill, D. A. (2007). Secondary trauma or secondary disaster? Insights from Hurricane Katrina. *Sociological Spectrum*, *27*, 613-632. doi:10.1080/02732170701574941

Little, C. (2016). *More info on the impact of Monday's tsunami.* Retrieved from www.geonet.org.nz/news/3S4uP23hJe6Ye2ukMAoY2o

North, C. S., Pfefferbaum, B., & Tucker, P. (2002). Ethical and methodological issues in academic mental health research in populations affected by disasters: The Oklahoma City experience relevant to September 11, 2001. *CNS Spectrums*, *7*, 580-584. doi: 10.1017/S1092852900018186

Perry, N. (2016). Timeline of the 7.8 quake and response reveals plenty of room for improvement, Online. *The Press*. Retrieved from www.stuff.co.nz/national/nz-earthquake/86654229/a-timeline-of-how-the-78-quake-and-response-unfolded-with-plenty-of-room-for-improvement

Reserve Bank of New Zealand (2016). *Financial stability report November 2016* replay [Youtube Video]. Retrieved from www.youtube.com/watch?v=pP6nt4pvXVU&feature=youtu.be

The Treasury (2016). *Half year economic and fiscal update (December 2016)*. Retrieved from www.treasury.govt.nz/budget/forecasts/hyefu2016/hyefu16.pdf

Young, A. (2016, 14 November). Tourists to be evacuated from Kaikoura after earthquake. *The New Zealand Herald.* Retrieved from www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11747887

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